Clark Canyon Draft Resource Management Plan
for Clark Canyon Reservoir and Barretts Diversion Dam

Chapter 2
Existing Conditions

2.0 Existing Conditions

This Chapter discusses the existing physical, biological, economic, and other characteristics of the project area and region. The consideration of these existing conditions provide the context within which Reclamation has developed and will implement the RMP, and are therefore important to present here to provide a general understanding of the general conditions of the project area.

2.1 Physical Resource Conditions

2.1.1 Climate

The climate of the South Central Mountains can be broadly described as continental and is typical of the high elevation arid lands in the region, with wide variability between summer and winter. Occasionally, cold arid arctic air moves down over the area creating winter temperatures below zero.

The average annual precipitation measured in Dillon, Montana has been approximately 11.6 inches in the last thirty years (1971 – 2000). There has been a significant drought for the past 5 years (1999-2003). Between 1900 and 1925, the average rainfall was 18.3 with every year experiencing more rainfall than the recent average of 11.6 inches. For a longer historical period (1901-1940), the average annual precipitation at Dillon was 16.67 inches. The wettest months are generally May or June with approximately 75 percent of the precipitation falling in the six months, April to September. There is a wide range in the annual rainfall with 6.9 inches in 1974 and 19.2 inches in 1995 (WRCC 2002).

The average annual temperature varies widely by season and within each month. The hottest months are July and August with average maximum temperature of 84° and 82° F and average minimums of 47° and 46° F, respectively. The coldest months are normally December and January with average maximum temperatures of 34° F and average minimum of 14° F (WRCC 2002).

The closest national weather station is located in Dillon, Montana, which is 19 miles north of Clark Canyon Reservoir. The temperatures at the reservoir tend to be slightly cooler than those reported near Dillon; however the area around the reservoir experiences fewer frost-free days than Dillon. There are approximately 70 to 90 frost free days at the reservoir compared to 103 frost free days in Dillon (USDA 2002, and personal conversation, Gary Berger, Natural Resources Conservation Service, Dillon, MT, 10/4/2002). Frequently, the reservoir also experiences high winds limiting boat launching and other outdoor activities.

2.1.2 Geology

The geologic history of southwestern Montana is complex and is of regional interest for geologists. The geology was shaped by processes following the intense mountain building activity that resulted in the Rocky Mountains. Regional compressions and extensions resulted in a system of northeast and northwest trending faults and basins such as the Beaverhead Basin. Great volumes of sediment washed into basins from surrounding mountains. Volcanic activity blanketed the area with ash and produced fields of volcanic rocks, some with substantial quantities of andesite. Climatic changes also produced geologic affects. Tropical periods with lush vegetation prevented widespread erosion

and the streams flowed in more permanent channels and carried fine-grained sediments. During arid periods permanent streams became ephemeral and there was less vegetation to maintain the channel and to prevent erosion. As a result coarser-grained sediments were deposited in flash floods that spread sediments across the landscape. While the landscape continues to be modified, it is much less dramatic. The streams create alluvial deposits, and landslides have occurred along steep slopes of clayey materials. (Garsjo 2002, Alt and Hyndman 1986).

At Clark Canyon Reservoir the geology is also complex. Rocks in the area show a very wide variety of ages, from pre-Cambrian to Quaternary eras. Northwest trending thrust faults intersect the older sediments that are folded into a series of north trending synclines and anticlines. The Tendoy thrust fault separates the south plunging Armstead anticline in the Red Rock basin from the Clark Canyon Syncline. Gentle folding, high-angle block faults influenced the drainage system and there were three major erosional cycles creating thick sediments, terraces, and modern stream flats.

The result is that the east boundary of the reservoir is gently sloping Tertiary conglomerate sandstone and Quaternary gravels. The northwest portion of Clark Canyon Reservoir has formations ranging from Pre-Cambrian gneiss and Paleozoic rocks, limestone, granite, and quartzite. The southwest boundary is composed of Quaternary sediments. These are mapped as primarily Quaternary terrace gravels and alluvial fans, but include limestone and quartzite formations. The drill logs of the area show gravels in thicknesses of up to more than 175 feet in areas at the reservoir site.

There are visible geologic resources of interest to people driving on I-15 from Monida Pass north through Montana. In the immediate area of the reservoir are two notable examples. East of the reservoir, across the highway, is an expanse of Beaverhead conglomerate, a formation that is very limited in the region of southwest Montana.

The second example is found at the Tendoy Range, west of the reservoir. The edge of the Tendoy Range is defined by the Red Rock Fault. The fault creates a straight face to the range that is visible from the reservoir (Alt and Hyndman 1986).

Further north, close to Barretts Diversion Dam, are volcanic rocks (white rhyolite ash and red brown andesite) that are thought to be from two generations of volcanism, 50 and 70 million years ago. The reddish brown hill, located about 10 miles north of Dillon, is possibly the one that Clark identified in his journal as Beaverhead Rock (Alt and Hyndman 1986). It is volcanic andesite and could have been the landmark that helped Sacajawea guide the expedition. The Rattlesnake Cliffs, north of Barretts Diversion Dam were named by Lewis in 1805 and are composed of andesite up thrown on the Blacktail fault (Garsjo 2002). The cliffs form the entrance to the Beaverhead River Canyon.

Montana has a history of large and damaging earthquakes. Several active earthquake zones are located in southwest Montana. The nearest fault zone to Clark Canyon Reservoir is the Red Rock valley, a NW-trending graben, which extends from Lima to the Clark Canyon Reservoir (Stickney, M.C. 1995). A graben is a down-dropped block of the earth's crust resulting from extension, or pulling, of the crust. The east-dipping Red Rock fault bounds the southwest valley margin but extends only half the distance northwest to Clark Canyon Reservoir. The central portion fault zones are the most seismically active segment of the Red Rock valley region and have experienced earthquakes clusters in 1985 and 1996 along with frequent micro earthquake activity. The 1985 clusters occurred prior to good regional seismic instrumentation, and few events were suitably recorded for first motion analysis.

Two earthquakes occurred at opposite ends of the Red Rock valley graben in April 1991 and March 1994. Despite the lack of a detailed mapping of the graben separation, the March 1994 earthquake indicated that the northern part of the Red Rock graben experienced NE-SW faulting

2.1.3 Mineral Resources

Many energy and mineral resources occur on both private and government-managed lands within Beaverhead County. These resources have great economic potential for the local area (BCRUC 2003). However, there are no known mineral deposits located in the project area except for sand and gravel. Historically, there had been sand and gravel mining in the reservoir area for local use (Holt 1956). Sand and gravel deposits will be used by Reclamation on an as needed basis for project related purposes; such as construction and maintenance of dams, facilities, and recreation areas. The Bureau of Land Management manages all subsurface mineral resources (excluding sand and gravel) on the land owned by Reclamation around Clark Canyon Reservoir.

2.1.4 Soils

The area surrounding Clark Canyon Reservoir is generally characterized by a series of intermountain valleys characteristic of the topography of southwestern Montana. The Blacktail Range bound the valley to the east and northeast, by the Pioneer range to the northwest, and the Tendoy Range to the southwest.

The soils at Barretts Diversion Dam, at the mouth of the Beaverhead River Canyon, are in the process of being mapped by the National Resources Conservation Service (NRCS). The soils are dominated by Rivra, Cool-Beavrock Complex (USDA NRCS 2002). The complex is approximately 45 percent Rivra and similar soils, and 40 percent Beavrock and similar soils. Rivra soils are characterized as gravelly sandy loam and well drained with frequent flooding. The Beavrock soils are silt loam and poorly drained with occasional flooding.

Clark Canyon Reservoir has not been mapped by NRCS but can be generally described from a few sources. The 1956 assessment of fish and wildlife for the construction of the dam describes the soils

as brown or grayish-brown, granular, gravelly loam over gravelly subsoil (USBR, 1956). The valleys are filled with lacustrine and fluviatile deposits. The mountain slopes in the area around Clark Canyon Reservoir are mostly covered by alluvial fans and alluvial deposits derived from the underlying rocks. Limited exposure of bedrock found in cliffs and canyons reveal igneous sedimentary and metamorphic rocks.

Core sampling done in 2001 to investigate the Clark Canyon landslide located approximately 4 miles north of the dam described the upper feet of the core sample to be generally silty, sandy, and gravelly (McDonald 2001).

2.1.5 Air Quality

According to the U.S. Environmental Protection Agency's (USEPA) air database and the State of Montana's Department of Environmental Quality (MDEQ), there are 13 areas in the state of Montana that are classified as "non-attainment". Non-attainment refers to areas of the country where air pollution levels persistently exceed the national ambient air quality standards. Particulate matter is the most common cause of non-attainment in Montana; however, Billings is considered a non-attainment area for sulfur dioxide (MDEQ, 2003). The non-attainment areas are centered primarily on high population areas, including the Missoula area in the northwest portion of the state. USEPAS Monitor Trends Report (2003) indicates that the number of days when air quality within monitored counties throughout the state was "good" or "moderate" far exceeded the number of days when air quality was classified as "unhealthy".

Air quality at various locations within the state of Montana is monitored and data is collected by the MDEQ. According to the MDEQ, the principal air quality concern in Beaverhead County is PM_{10} (particulate matter less than ten microns in diameter), which may have harmful effects on the human respiratory system. MDEQ also has noted that many federal, tribal, and state forestry managers increase the use of prescribed burns to create resource benefits on public lands. Although this practice can benefit habitat, the natural by-product of the burning is smoke, which is primarily made up of particulate matter (MDEQ, 2003).

The primary contributor to PM_{10} in the Dillon area appears to be associated with industrial activity six miles south of Dillon around the Barretts Minerals. Inc., a talc plant (which is approximately 0.5 miles north of Barretts Diversion Dam). In September 1984, a monitoring site was established at the Beaverhead County Courthouse (Monitoring Site #30-001-0001). This site, the nearest air quality monitoring station to the project area, operated for two years until June 1986. The monitoring data showed relatively low readings and it was determined that continued monitoring was not warranted. As such, only limited air quality data specific to the project area is available.

The most likely contributors to air pollutants within the project area are motor vehicle emissions (including automobile and truck traffic on I-15 and other area roadways, as well as, boat and personal watercraft (PWC) operation on Clark Canyon Reservoir), diesel-engine trains that use the railway, which passes east of Clark Canyon Reservoir and west of Barretts Diversion Dam, fugitive dust emissions (primarily from motor vehicle operation on unpaved roads), smoke from wood burning stoves, fireplaces, and campground fires, and controlled burning of open land.
Air Quality Regulation - Under the Clean Air Action of 1970, the U.S. EPA developed primary and secondary National Ambient Air Quality Standards (NAAQS) for each of the seven criteria

pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, fine particulate matter, and sulfur dioxide. These standards establish pollution levels in the United States that cannot legally be exceeded during a specified time period. The State of Montana has adopted additional state air quality standards. These Montana Ambient Air Quality Standards (MAAQS) establish statewide targets for acceptable amount of ambient air pollutants to protect human health. In addition, congress also classified select regions of the country as areas designed as Prevention of Significant Deterioration (PSD). The classification differs in the amount of development allowable within the area. In Montana, the only areas designated as Class I areas (the most restrictive limits on development) are two National Parks, several National Wilderness areas, and several Native American Reservations. The nearest Class I area is Red Rocks Lakes, located approximately 100 miles southeast of Clark Canyon Reservoir near the southeast border of Beaverhead County and Madison County.

2.1.6 Water Quantity (Hydrology) and Water Quality

Water Quantity - Clark Canyon Reservoir was built in 1964 primarily for irrigation purposes. The East Bench near Dillon needed a reliable source of irrigation water, and the reservoir was designed to provide full irrigation water to 21,800 acres and supplemental irrigation water for an additional 28,000 acres. Secondary purposes of the reservoir include flood control and recreation.

Clark Canyon Dam has a total drainage area of 2,315 square miles and the two main sources of inflow to the reservoir are Red Rock River and Horse Prairie Creek (as shown on Location Map). During the 39 years of record since the construction of the Dam, the average annual inflow into the reservoir is 274,500 acre-feet (see Table 2.1-1). In 1984, the maximum yearly inflow occurred with a total of approximately 718,100 acre-feet. The minimum yearly inflow occurred in 2003 with a total of approximately 105,189 acre-feet.

The elevation of the reservoir is controlled by the operating plan established for Clark Canyon Reservoir. There is some target elevations used to manage the reservoir and to allow for protection against naturally occurring floods. The reservoir management plan calls for the storage between elevations 5542.1 above mean sea level (msl) and the spillway elevation of 5560.4 msl to be exclusively used for flood control. Storage between elevations 5535.7 and 5542.1 msl is referred to as the joint use pool and can be used for irrigation storage as well as flood control. The surface area of the reservoir at the top of the active conservation pool is 4,496 acres at elevation of 5535.7 msl. Clark Canyon Reservoir has reached this elevation in 32 of the 39 years of operation. At the top of the joint use pool, the surface area of the reservoir is 4,935 acres at elevation of 5542.1 msl. The reservoir has reached this elevation in 31 of the 39 years of operation. At the spillway, the surface area of the reservoir is 5,903 acres at elevation of 5560.4 msl. The reservoir has reached this elevation only once (in 1984) during the 39 years of operation. Table 2.1-2 provides a summary of important elevations, storage capacities and surface areas, and the probability of occurrence for each.

Table 2.1-1
Clark Canyon Reservoir Historical Monthly Inflows

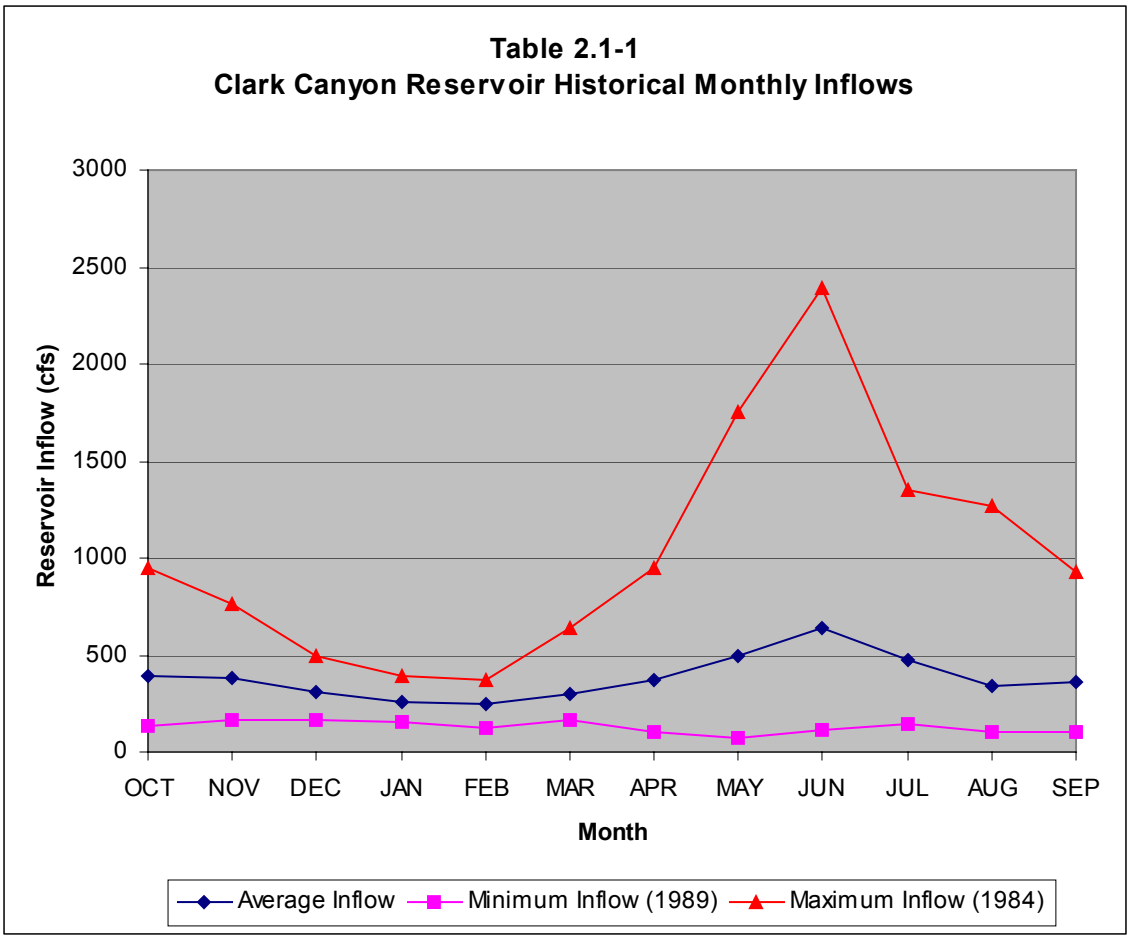


Table 2.1-2
Clark Canyon Reservoir Elevation Summary Table

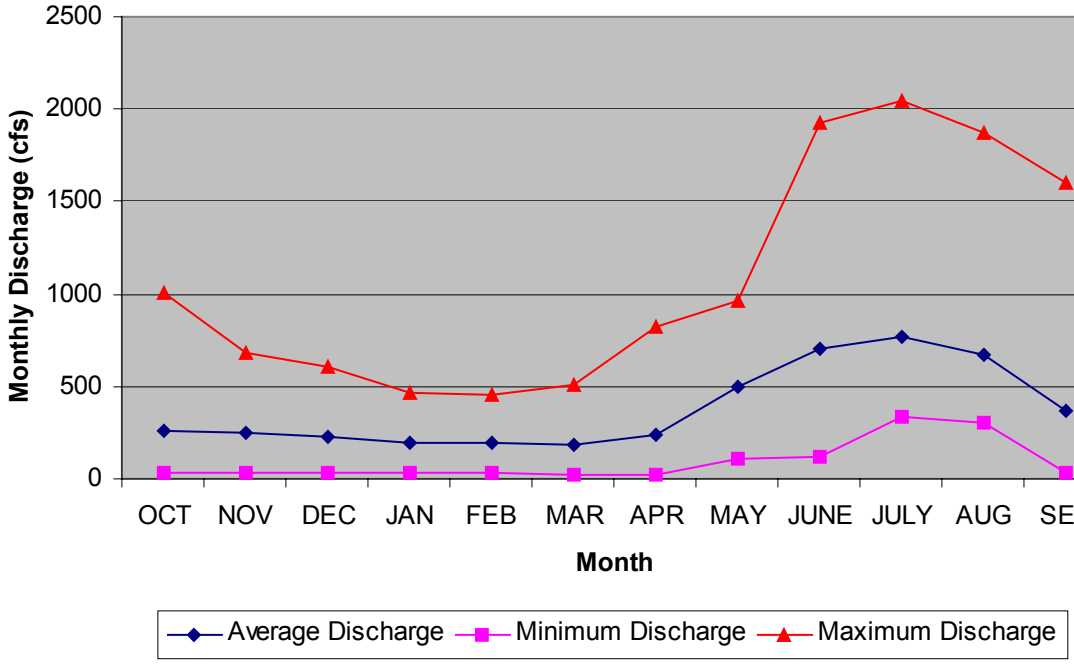
Description	Elevation (ft)	Probability	Storage Capacity (acre-feet)	Surface Area (acres)
Maximum Water Surface	5571.9	0%	328,979	6,600
Spillway Crest	5560.4	3%	257,152	5,903
Top of Joint Use Pool	5542.1	79%	157,863	4,935
Top of Active Conservation Pool	5535.7	82%	127,626	4,496
Top of Inactive Storage Pool	5470.6	100%	1,500	209

When irrigation season begins approximately (May 1st), the average level of the reservoir is 5,540.9 msl. The surface area of the reservoir at this elevation is 4,868 acres. In a normal (or average) year, the reservoir drops approximately 10 feet during the irrigation season. At the end of irrigation season (September 30th), the average level of the reservoir is 5,530.9 msl. The surface area of the reservoir at this elevation is 4,109 acres. During most years, approximately 759 acres of shoreline are exposed during the irrigation season. See Figure 2.1-1 to see the surface area of the reservoir at elevations discussed above.

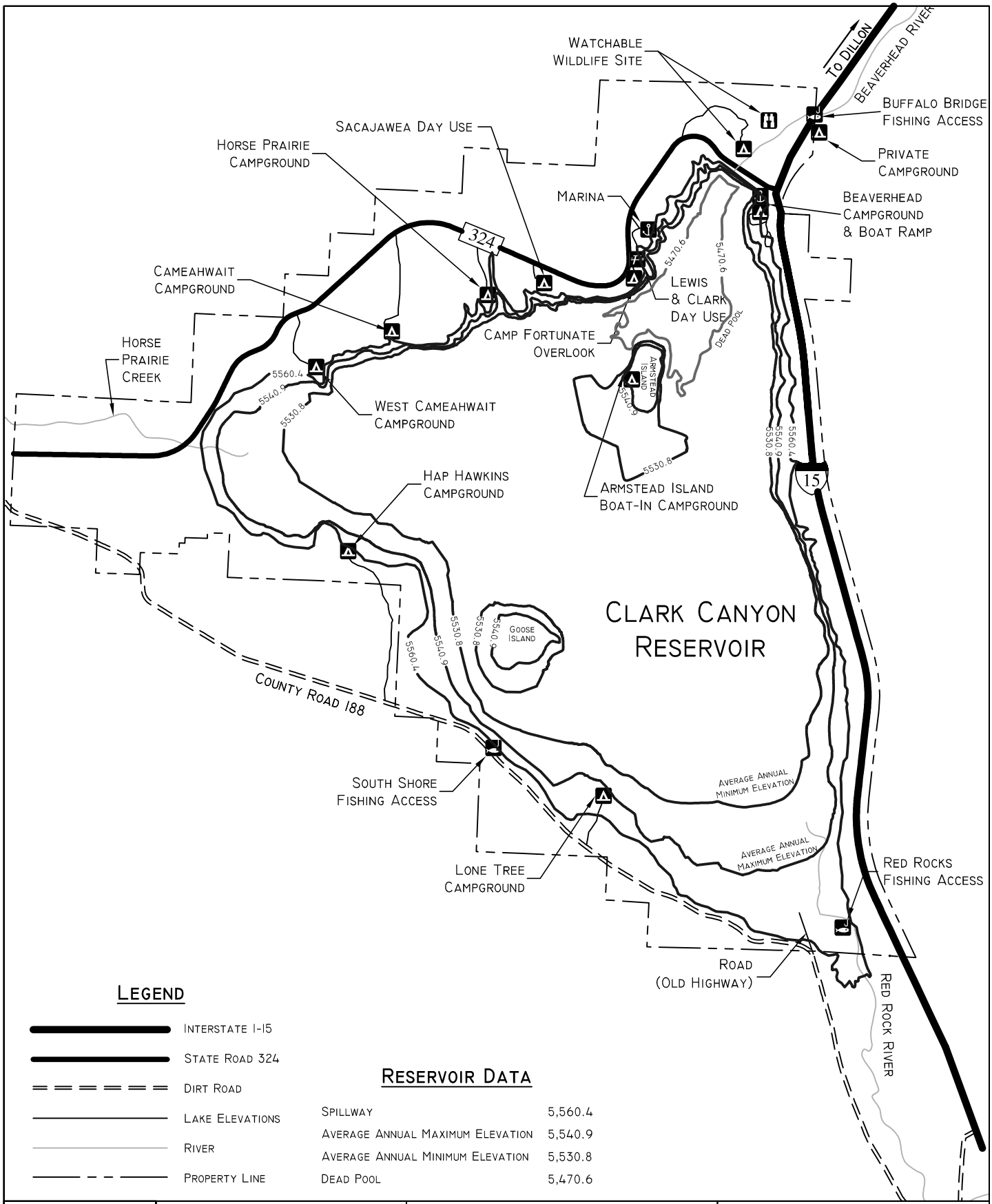
As of early April 2004, the approximate elevation of the reservoir is approximately at elevation 5,516 msl. The western United States is in the 5th year of a drought cycle. The drought has taken its toll on the storage and consequently the elevation of the reservoir. Due to the drought, the reservoir is at its lowest level since Clark Canyon Reservoir was filled in 1964. The surface area of the reservoir at elevation 5,490 msl is 937 acres. This change in elevation of the reservoir had the greatest impact on the south and southwest shorelines. Because of the gradual slopes in these areas, a slight change in reservoir elevation translates into longer stretches of shoreline that are exposed. The least impact of this drought cycle has occurred on the northwest shoreline. The slope into the reservoir is more pronounced as a change in water level has a reduced effect on exposed shoreline.

The minimum releases from the reservoir have been adjusted this year (2003) to retain as much irrigation water as possible in the reservoir. In August 2003, the minimum flow released from the reservoir was 25 cubic feet per second (cfs). Table 2.1-3 shows monthly average, maximum and minimum discharge flow rates for the reservoir.

Table 2.1-3
Clark Canyon Reservoir Monthly Discharge Flow Rates



The average stream flow below the Clark Canyon Reservoir at the beginning of the irrigation season on approximately May 1 is 500 cfs. It normally peaks in July at 775 cfs and reduces to 475 at the end of September. During the non-irrigation season of October 1 thru April 30, the average stream flow is 475 cfs to 200 cfs with a minimum of 25 cfs. During the last couple of drought years, the minimum flow has been 25 cfs.



LEGEND

- INTERSTATE I-15
- STATE ROAD 324
- DIRT ROAD
- LAKE ELEVATIONS
- RIVER
- PROPERTY LINE

RESERVOIR DATA

SPILLWAY	5,560.4
AVERAGE ANNUAL MAXIMUM ELEVATION	5,540.9
AVERAGE ANNUAL MINIMUM ELEVATION	5,530.8
DEAD POOL	5,470.6

FRANSON NOBLE ENGINEERING

DATE: AUGUST 2004
SCALE: 1" = 4000'
Lake Level.dwg
H:\Client/5-USBR Area/1-Projects/Clark Canyon-MT/6-Maps & Figures/Drawings/Barretts

BUREAU OF RECLAMATION

CLARK CANYON RESERVOIR
VARIOUS RESERVOIR LEVELS

FIGURE 2.1-1
RESERVOIR ELEVATIONS

Since the construction of the Clark Canyon Reservoir flooding has not been a problem and high flows have stayed within the banks of the Beaverhead River downstream of the dam.

Water Quality - Water quality within Clark Canyon Reservoir is affected by several factors, including water quality in the two primary tributaries, Red Rock River and Horse Prairie Creek; water levels within the reservoir; and contributing factors from land uses surrounding the lake. The water quality within Clark Canyon Reservoir is safe for all contact sports and recreation and is considered to be "clean", as compared to other similar reservoirs.

Water quality sampling at Clark Canyon Reservoir began in 2001 and continued through 2003. The general purpose of the sampling has been to identify potential problems and to establish baseline data, which will be compared to future data to determine changes in the reservoir. Five sites were sampled within the reservoir, as well as both inflows (Red Rock River and Horse Prairie Creek and the Beaverhead river immediately below the dam). Sampling occurred on a monthly basis beginning in April and continuing through October.

Basic limnological evaluations were completed at each site within the reservoir, consisting of water column profiles, depth, nutrients, chlorophyll, phytoplankton, and zooplankton samples. Water column profiles recorded water quality parameters for dissolved oxygen, specific conductance, pH and temperature from surface to bottom. Zero to 5 meter integrated samples was collected for chlorophyll analysis. Integrated samples of phytoplankton and 0-15m integrated samples of zooplankton were collected at 0-5m at each site for determining the number of species and density. Nutrient grab samples were collected from both the hypolimnion and epilimnion (i.e. near the bottom and top) of the lake. Samples were analyzed for ortho-phosphate, nitrate, ammonia, and nitrogen. Sediment samples for trace metals were collected in 2003. Samples were analyzed for identification and quantification of total extractable metals. The findings of the study should be summarized in a report by September 2004.

The inflows and outflow of Clark Canyon Reservoir water quality parameters tested for included temperature, dissolved oxygen, specific conductance, pH, ortho-phosphate, nitrate, ammonia, and nitrogen. All samples were taken in shallow (<1m) moving water near the shoreline.

The Clean Water Act requires States to set water quality standards and enforce them. Flowing out of Clark Canyon Reservoir, the Beaverhead River is listed on the State of Montana's 2002 303(d) List of Impaired Water Bodies for the segment from Clark Canyon Dam to Grasshopper Creek. This segment does not meet Montana State Water Quality Standards. The factors contributing to this listing include bank erosion, dewatering, flow alteration, and inflows from agricultural and mining sources. In addition, Horse Prairie Creek from the headwater to Clark Canyon Reservoir and a portion of Red Rock River from Lima Reservoir to Clark Canyon Dam are also included on the state of Montana Department of Environmental Quality 303 (d) list of impaired water bodies.

2.2 Biological Resource Conditions

2.2.1 Vegetation

The Clark Canyon Reservoir is east of the Continental Divide with a continental climate. It is typical of the high, arid lands in the region, with wide variability between summer and winter. The Reservoir area is in the Beaverhead Mountains Section (Section M332E) of the Northern Rocky Mountain physiographic province (McNab 1996). The Beaverhead Mountains Section is generally mountainous with broad valley bottoms. Vegetation in the section consists of two primary types: 1) sagebrush steppe with small areas of alpine vegetation above 9,500 feet (75 percent) and 2) Douglas-fir forest (25 percent).

Clark Canyon Reservoir is in a valley bounded by the Blacktail Range to the east and northeast, by the Pioneer range to the northwest, and the Tendoy Range to the southwest. The reservoir has approximately 5,903 acres of surface area and 17 miles of shoreline at 5535 feet (top of active conservation pool elevation). The project area covers approximately 4,350 land acres surrounding the reservoir and owned by the Reclamation (USDOI 2002). Of the land acres, approximately 150 (less than five percent) are developed for campgrounds, picnic areas, and boat launches. Much of the area was once irrigated pastured or hayed before the reservoir existed.

The land around the reservoir is one of the westernmost examples of short grass prairie habitat. Short grass prairie habitat is more common further east of the mountains. The grasses are primarily native bunch grasses and wheat grasses. There are swales in the reservoir land with sagebrush communities but extensive sagebrush steppe is more prevalent further toward the mountains. Mud flats appear in the reservoir seasonally as the water recedes. They generally develop populations of leafy spurge, a noxious weed.

2.2.2 Riparian Vegetation and Wetlands

As previously stated, the two main watercourses that supply water to the Clark Canyon Reservoir are the Red Rock River to the south and the Horse Prairie Creek to the west. The reservoir drains to Beaverhead River. Willows, cattail marshes, and wet and semi-wet meadows border these three watercourses and riparian areas. Riparian habitat and cattail marsh wetlands only cover small portions of the land in southwest Montana (less than one percent) but support much of the wildlife.

The Red Rock River is south of Clark Canyon Reservoir and is located in the wide valley bottom. The river meanders through an emergent wetland and varies in size depending on runoff. The Red Rock River riparian area is predominately willow with adjacent semi-wet meadow including rushes and sedges. Based on field observations, there appears to be a buildup of plant residue in the riparian area and there are large patches of the noxious weed Canada thistle near the south boundary of the Reclamation land. West of the Red Rock Creek riparian zone, is a monoculture growth of reed canary grass. The reed canary grass appears to cover the area from the mid-reservoir water level to the high water level. The reed canary grass also appears to include a buildup of plant residue.

Much of the area adjacent to Horse Prairie Creek was once hay land or irrigated pasture, however, it has not been irrigated or grazed by domestic livestock since Clark Canyon reservoir was built in 1964. Based on field observations, there also appears to be a buildup of plant residue and there are patches of the noxious weeds, Canada thistle, and whitetop.

Mud flats are located along segments of the reservoir during periods of low water. These mud flats provide habitat for shore birds such as marbled godwits, long-billed dowitchers, willets, western sandpiper, and spotted sandpiper. Pelicans have been seen in late summer (personal conversation J. Kirkley, University of Montana, Dillon, 4/17/03).

Barrett's Diversion Dam has combined willow and cottonwood riparian habitat and also has a cattail marsh. The tree, shrub, marsh combination, together with rock faces on both sides of the adjacent road, provide a variety of habitats for bird nesting and foraging.

2.2.3 Noxious Weeds

Noxious weeds can be a serious environmental problem to natural resources. Noxious weeds can displace native plant communities (including endangered species), alter wildlife habitat, reduce forage for wildlife and livestock, increase erosion, and lower biodiversity. The Federal Noxious Weed Act of 1974 requires that each federal agency develop a management program with adequate funding to control undesirable plants on lands under its jurisdiction. It also requires that the agencies implement cooperative agreements with state agencies to coordinate management of undesirable plants.

Executive Order 13112 of 1999 was enacted to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts". In this act, federal agencies were directed to: 1) prevent introduction of invasive species, 2) detect and respond to control such species in a cost-effective and environmentally sound manner, 3) monitor invasive species populations accurately and reliably, 4) provide for restoration of native species and habitats, 5) conduct research on invasive species and develop prevention and control techniques, and 6) promote public education on invasive species. Furthermore, they were directed to not authorize, fund or carry out actions that are likely to cause or promote invasive species. Federal agencies are also required to pursue these duties in cooperation with stakeholders.

The Montana County Noxious Weed Control Law (MCA 7-2101 through 2153) was established in 1948 and amended in 1991, to protect Montana from destructive noxious weeds. It established a set of criteria for the control and management of noxious weeds in Montana and is implemented and enforced at the local county level through county weed control boards. Montana law makes it unlawful for any landowner to permit noxious weeds to propagate or produce seeds on their land unless they adhere to the noxious weed management program of their county. While Montana laws do not apply to federal lands, the Federal Noxious Weed Act requires cooperative planning with the state/local weed administration.

Beaverhead County Weed District is active in highway weed management and works with the Reclamation and other landowners to control noxious weeds. Table 2.2-1 is noxious weeds listed by the state and Beaverhead County Weed District. The noxious weeds that are targeted for containment and suppression on the Clark Canyon Reservoir resource area are: whitetop (hoary cress), Canadian thistle *(Cirsium arvens*e), leafy spurge *(Euphorbia esula)*, and spotted knapweed *(Centaurea maculosa)* (personal communications Jack Eddie, Beaverhead County Weed District,

Dillon MT) and are described below. Descriptions for these species are described below. They are all Category One Noxious Weeds, which are defined by Montana's Weeds Control Law as: Currently established and generally widespread in many counties of the state.

Whitetop (Hoary cress) *(Cardaria draba)*

Whitetop is a deep-rooted perennial plant that reproduces from root segments and seeds. Plants emerge in early spring and bloom and set seed by mid-summer. This plant is common on alkaline, disturbed soils and is highly competitive with other species once it becomes established. Control is difficult because of the perennial root system, abundant seed production, and diverse habitat of the plant. (Esser 1994)

Whitetop may have some forage value but the foliage becomes coarse and bitter as it matures. Until research is able to better evaluate its toxicity, McInnis (McInnis et. al. 1993) recommends the following cautionary measures when allowing livestock to graze infested rangelands: provide supplemental iodine, graze mature and non-lactating animals, and provide alternate grazing areas.

Canada thistle (*Cirsium arvense*)

Canada thistle is a non-native, colony-forming perennial with deep and extensive horizontal roots. Canada thistle reproduces both through seed and asexually with spreading roots, root fragments, or from subterranean stem tissue. It has the potential to rapidly infest an area through vegetative reproduction. This aggressive weed is difficult to control. Flowering occurs during July and August. Canada thistle is generally not considered palatable by livestock. They generally avoid Canada thistle and may also avoid grazing in areas with heavy infestations. Fire may kill the above ground portion of Canada thistle, but the below ground portion can survive even severe fires (Zouhar 2001a).

Leafy spurge (*Euphorbia esula)*

Leafy spurge is a perennial that reproduces by vigorous rhizomes and seed. It generally grows in clumps, up to 3 feet tall. Leafy spurge has an extensive underground rhizome and root system that can penetrate the soil to 15 feet to 30 feet deep. The deep rooting and thick, corky root bark help give the species drought resistance. The plants store carbohydrates and nitrogen within the rhizomes during fall and winter. Reserves accumulate in the fall as top-growth dies and are in low supply during the growing season. The entire plant contains a milky juice that has been reported to cause severe irritation of the mouth and digestive tract in cattle and may result in death. Cattle prefer to graze where there are not large infestations. The extensive root system containing large nutrient reserves makes leafy spurge extremely difficult to control (Simonin 2000).

Spotted knapweed (*Centaurea marculosa)*

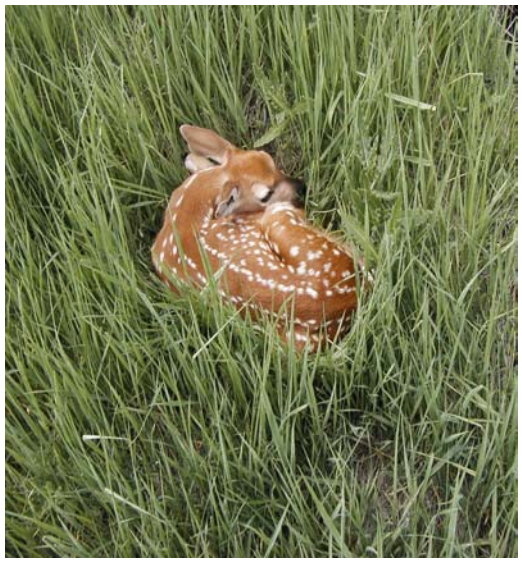
Spotted knapweed is a biennial or perennial with a stout taproot. Spotted knapweed reproduces almost entirely from seeds that is known for their longevity and durability. Knapweeds readily establish themselves on any disturbed soil, and their early spring growth makes them competitive for soil moisture and nutrients. Spotted knapweed has good nutritional value and is eaten by livestock

and wildlife. Generally, use of spotted knapweed is highest during early season when the plants are green and actively growing in the rosette and bolt stages. However, it can impede access to other forage when there are old stems that form a spiny over story (Zouhar 2001b).

Clark Canyon management priorities currently include awareness and education, containment and suppression of existing infestations, and the prevention of new infestations. Beaverhead County is contracted by the Reclamation to treat the noxious weeds at Clark Canyon Reservoir and Barrett's Diversion Dam. The County has also posted educational signs in several places around the reservoir. The noxious weed infestations that receive treatments are around the campgrounds and Beaverhead River below the dam. There is also a large infestation of leafy spurge in the area of the reservoir that is exposed due to low water (personal communication J. Eddie, Beaverhead County Weed District, Dillon, MT, 4/15/03).

While bio-control has been used in the past to treat leafy spurge, current weed treatment consists of herbicide application. In 2000 and 2001, weed treatment was reduced by at least half resulting in a notable spread in weeds (personal communication S. Morehouse, Bureau of Reclamation, Dillon, MT, 4/31/03). Beaverhead County Weed District resumed full treatment in 2002 and has increased its activities by obtaining a grant from the Montana Noxious Weed Trust Fund. The grant provides for up to five years of additional treatment on spotted knapweed that is 300 feet each side of the Beaverhead River on Reclamation property below the dam (personal communication J. Eddie, Beaverhead County Weed District, Dillon, MT, 4/15/03). The determination of effectiveness of noxious weed treatments is based on observation. The current program has not been monitored and there is not a clear determination of whether the noxious weeds are being contained or not.

2.2.4 Wildlife



As described in section 2.2.1, Vegetation, Clark Canyon Reservoir lands are primarily short grass prairie with areas of sagebrush habitat in the uplands. There are three riparian areas with willow and cottonwood habitat, cattail marshes, wet and semi-wet meadows. As stated earlier, mud flats are exposed during period of low water. The flats provide habitat for shore birds such as marbled godwits, long-billed dowitchers, willets, western sandpiper, and spotted sandpiper. Pelicans have been seen in late summer (personal conversation J. Kirkley, University of Montana, Dillon, 4/17/03). These diverse habitats around Clark Canyon support many bird and animal species such as golden eagles, ferruginous hawk, chestnut-collared longspurs, antelope, and white tailed deer. The sagebrush in the drainages also provides habitat for pygmy rabbits.

The wet and semi-wet meadows and cattail and willow wetland adjacent to the streams provide forage and nesting habitat for several migrant birds including yellow-headed blackbird, red-winged blackbird, common snipe, Wilson's phalarope, rails, sora, and several species of ducks. The cattail marsh, which is located on the Beaverhead River immediately below the dam, is spring fed and has a

constant temperature of 54° Fahrenheit (12° C). It remains unfrozen and provides year round refuge for a myriad of wildlife species.

The portion of Beaverhead River immediately below the dam is diverse and well suited for viewing wildlife, springs, river, and plant diversity. It has been identified as a Montana Wildlife Viewing Area for the Montana State Watchable Wildlife Program by a panel of wildlife experts from state and federal organizations. The goals of the program are to: 1) Identify and enhance opportunities for the public to enjoy wildlife on public and private lands; 2) Contribute to local economic development; 3) Promote learning about wildlife and habitat needs; and 4) Enhance active public support for resource conservation selected all sites. There is signage on the highway identifying the site and interpretive signage at the site. It is also listed in tour books as a Montana Wildlife Viewing Area.

The reservoir is in the Beaverhead/Red Rock Corridor flyway for migrating birds. It is a known resting or foraging spot for many migrant birds. During spring migration, loons are seen in the reservoir, courting behavior has been observed, and a nesting pair has been documented (personal conversation S. Morehouse, Bureau of Reclamation, Dillon, MT). Snow geese, trumpeter swans, and tundra swans often stay in the reservoir area for days or weeks, depending on surface water area, as they migrate through the area to nest in Red Rock Lakes National Wildlife Refuge to the southwest.

Horse Prairie Creek is in a narrower valley than Red Rock River and the creek and has a more direct course. Montana State Route 324 (SR 324) runs west from the reservoir along Horse Prairie Creek. There is also a remnant of an old railroad grade in the drainage. The area is west of the Clark Canyon Reservoir and is generally managed for wildlife habitat. Based on field observation and personal conversation with B. Gibbons (Rangeland Management Specialist, NRCS Dillon Montana, 6/19/03) it appears that the willows and cottonwood north of SR 324 are in poor condition with many already dead. This appears to be a result of channel changes and the recent drought that have left the plants on dry ground. The new channel does not have new cottonwoods and has only a few shrubs and willows components in the riparian vegetation.

At Barrett's Diversion Dam, the tree, shrub, marsh combination, together with rock faces on both sides of the adjacent road, provide a variety of habitats for nesting and foraging.

2.2.5 Fish

The Clark Canyon Reservoir provides a diversity of fish habitat with the lake environment and three streams. The Montana Fish and Wildlife and Parks (MTFWP), manages the fishery resource of the state, including those within the reservoir. The nationally renowned wild trout populations, unique species composition, easy accessibility by vehicles, developed campgrounds, boat launch facilities, and scenic qualities result in heavy angling pressure. The lake is therefore stocked to support harvestable populations under heavy use.

The reservoir provides fisheries for introduced rainbow and brown trout, native burbot, and mountain whitefish. Occasionally westslope cutthroat trout and brook trout have been found. Non-game species in the reservoir include native white and longnose sucker and non-native common carp and the redside shiner (discovered in 1998). The rainbow trout is stocked by MTFWP with annual additions of hatchery fish and the other species are wild and self-sustaining.

MFWP Fish Trap Facility on Red Rock River

Rainbow stocking is generally done in early June to take advantage of a favorable thermal regime and the growth phase of the claoceran zooplankton community. In general, the population size trends with the storage and surface area of the reservoir. Since management strategy of the rainbow trout stocking program shifted to the use of wild strain DeSmet and Eagle Lake strain spawning stocks, they have been monitored in the Red Rock River for migration and spawning. The Clark Canyon Eagle Lake rainbow trout population became an effective wild brood source of fertilized eggs for rearing as over-wintered yearlings in 1995. These fertilized eggs are used for fish stocking in Clark Canyon and in other locations. Since the program began, Clark Canyon has provided 300,000 – 500,00 fertilized eggs annually (Oswald 2002a).

The Beaverhead River, just below the dam, supports a variable population of brown and rainbow trout with brown trout being the dominant species. The limited rainbow trout population is primarily found between Clark Canyon Dam and Dillon, Montana. Angler use of the river has been so great that the MTFWP instituted regulations to limit "float parties."

2.2.6 Threatened, Endangered and Sensitive Species

In this document, Threatened and Endangered (T&E) species include only species listed by the USFWS as threatened and endangered, under the ESA. U.S. Fish and Wildlife were informally consulted to obtain information on known occurrences of T&E species (US Fish and Wildlife 2003).

Wildlife Species

Bald Eagle (*Haliaeetus leucocephalus*) is a federally listed threatened species. The Fish and Wildlife Service reclassified the bald eagle (*Haliaeetus leucocephalus*) from endangered to threatened in the lower 48 States in 1995. The bald eagle is a bird of aquatic ecosystems (Gerrard and Bortolotti 1988). It frequents estuaries, large lakes, reservoirs, major rivers, and some seacoast habitats. However, such areas must have an adequate food base, perching areas, and nesting sites to support bald eagles. In winter, bald eagles often congregate at specific wintering sites that are generally close to open water and that offer good perch trees and night roosts. Bald eagle habitats encompass both public and private lands. Bald Eagles build large stick nests lined with soft materials such as grass, leaves, and Spanish moss. Nests are used for several years by the same pair of eagles, with the birds adding materials each year. Nests are often very large, measuring 6 feet across and weighing hundreds of pounds. Young eagles can fly in 11 to 12 weeks, but the parents continue to feed them for 4 to 6 more weeks while they learn to hunt. There are known bald eagles nests within two miles of the reservoir on both Red Rock River and Beaverhead River. Rock outcrops at Barrett Dam may provide suitable nest sites for the eagle. The rivers and in the reservoir provide foraging habitat for the eagle. Foraging in the reservoir is particularly popular in the winter for many individual birds. In general, the population has grown significantly in the last couple decades and

cottonwoods along the streams are good potential nesting habitat (personal conversation with J. Rosco, Bureau of Land Management, Dillon Mt. 4/18/2003).

Other Wildlife Species

The Gray wolf, Canada lynx, and grizzly bear are also federally listed species and are listed as present in Beaverhead County but do not have suitable habitat in the project area (US Fish and Wildlife 2003). Therefore, these species will not be discussed further.

Plants Species

Ute Ladies' Tresses (*Spiranthes dilufialis*) is federally listed as a threatened species. It is a perennial orchid that arises from tuberous thickened roots and flowers in August-early September. It is known in braided streams with wetlands and swales in broad, open valleys, and at habitat margins with calcareous carbonate accumulation (MNHP 2002). *S. dilufialis* is listed as present in Beaverhead County but is not known in the project area (MNHP 2003). However, there may be potential habitat in the riparian areas adjacent to the reservoir and Beaverhead River.

2.3 Aesthetic Resources

This section describes the aesthetic environment of the study area, focusing on two primary aesthetic components: noise levels and the visual quality of the area. Although there are manmade features present and noise sources audible at both Clark Canyon Reservoir and Barretts Diversion Dam, each of these areas can afford visitors a general sense of solitude. The sections below describe the existing noise environmental and the visual character of the project area.

2.3.1 Noise Characteristics of the Project Area

Noise can be defined as the intensity, duration, and character of sounds from any and all sources. The discussion herein provides the general context of the existing noise environment within the study area. Measurements of actual noise levels within the study area have not been collected, and the discussion is based on observation and qualitative consideration of noise characteristics within the study area.

Noise Sources - In general, ambient noise levels at Clark Canyon Reservoir and Barretts Diversion Dam are consistent with rural, open space areas. Background noise levels are relatively low in most areas, with the notable exception of areas adjacent to roadways, including I-15 and SR 324, to the east and north of Clark Canyon Reservoir, and the Union Pacific railway, parallel to I-15 (see Section 2.7, Transportation Resources, for more detail on the transportation network within the study area).

I-15 experiences moderate volumes of truck and

passenger vehicle traffic, which create a relatively continuous noise source. SR 324 and other area roadways experience much lower traffic volumes and vehicle speeds are lower, resulting in lower and less consistent noise levels.

Barretts Diversion Dam is located on the northern end of a relatively narrow canyon through which I-15, the Union Pacific railway, and the Beaverhead River pass. Noise produced by vehicle travel along I-15 is audible at Barretts Diversion Dam; however, the contour relief provided by the elevated Union Pacific railway grade along with nearby trees may serve as a buffer, partially deflecting the noise generated along I-15 prior to its reaching Barretts Diversion Dam.

Other notable noise sources that contribute to the noise environment of the study area vary depending upon time of day, weather, and season, and include those associated with motorized recreational activities on and adjacent to Clark Canyon Reservoir, visitor activities at day-use and overnight campground areas, vehicular noise on area access roads, motorized water craft, and snowmobile traffic during the wintertime.

Of all the noise sources within the study area, motorized recreational vehicles (Off-Road vehicles (ORV) and watercraft in the summer and snowmobiles in the winter) may be the most prevalent. Noise from personal watercraft (PWC) and other motorized boats is reflected off the water and, depending upon weather conditions, can be heard at locations far from the source. In addition, because sounds levels from PWCs and motorized boats are highly variable as a result of engine revving (as opposed to more constant from a source such as pump or airplane) the noise tends to be more noticeable. In the wintertime, snowmobiles produce noise that is distinctly audible, especially in the context of relatively quiet winter days and nights.

Sensitive Receptors - The effects of noise on the aesthetic quality of an area is dependent upon factors including the presence of human receptors and the sensitivity of such receptors. Participants in noise-generating activities are considered to be less sensitive to noise. Conversely, visitors or residents not participating in activities which create significant noise levels may be seeking solitude, and are therefore, more adversely affected by the presence of significant continuous or variable noise. It should be noted, that individual recreationists within the study area, might be considered as sensitive or less sensitive, depending upon time of day and the activities in which they are participating.

Evening, nighttime, and early morning hours are the times of day that most area visitors and residents are most sensitive to noise. Thus, sensitive receptors are primarily considered to be campers present in the study area overnight, as well as some anglers.

Sensitive residential receptor locations within the area include residences located adjacent to Barretts Diversion Dam, on the east side of the Beaverhead River and to the east of the existing Barretts

Diversion Dam day-use shelter. A small number of residences located east of the I-15/SR 324 interchange (I-15 Exit 44) may not be considered sensitive receptors. Campgrounds and day-use areas adjacent to Clark Canyon Reservoir and at Barretts Diversion Dam (see Site Map) and a private campground located east of Exit 44 are also considered to be areas that are sensitive to noise associated with highway and road traffic.

2.3.2 Visual Resources and Quality of the Project Area

Specific scenic resources and the overall visual setting of the study area are recognized as an important component for recreational enjoyment of visitors, as well as to residents and travelers passing through the area. Due to the general openness afforded by gently sloping terrain that surrounds much of Clark Canyon Reservoir, the reservoir is highly visible from adjacent lands, and is a dominant feature of the landscape to travelers on I-15. Barretts Diversion Dam is less visible from surrounding areas and is located at the base of a steep canyon wall that is the most dominant feature. As such, the park is most visible primarily to visitors at the park and residents living east of the park. The following sections describe each of these areas in more detail.

Clark Canyon Reservoir - Although Clark Canyon Reservoir is man-made, the reservoir offers a some-what natural appearance, visible from surrounding shoreline areas and travelers on I-15. The reservoir is situated in a broad valley at the confluence of the Red Rock River and Horse Prairie Creek, and maintains a roughly triangular shape. The southwest shoreline is characterized by relatively gently rising hillsides that extend gradually upward and away from the reservoir whereas the northern shoreline is somewhat steeper and rises more abruptly. The eastern shoreline has a linear appearance, accentuated by I-15 and the Union Pacific rail tracks, which run parallel to the eastern shoreline of the reservoir.

The southern and western shorelines provide more of a marshy appearance, primarily in association with the stream deltas of Red Rock River and Horse Prairie Creek. Other than these two stream delta areas, shoreline areas generally consist of grasses, shrubs, and barren areas with compact or sandy soils that slope to the water's edge. Surrounding terrain is generally open, with low vegetation consisting of grasses, shrubs, and brush, broken up by occasional clumps of taller and denser vegetative cover.

Two visually dominant features in the northern end of the reservoir are Clark Canyon Dam and Armstead Island. Clark Canyon Dam is an earth and rock filled dam. The top of the dam serves as the crossing for SR 324. Armstead Island is dominant in the view of the reservoir from the Lewis and Clark Overlook, as well as most other nearby locations. The northern and western portions of the sparsely vegetated island rise abruptly from the surface of the reservoir, while the eastern and southern shores of the island have a more gradual slope.

The reservoir surface elevation fluctuates seasonally. During periods when reservoir levels are low there is a significantly reduced water surface area and a wide shoreline approach to the reservoir, especially along the gently sloping western and southern shorelines.

During wintertime, the reservoir surface freezes and is often snow-covered. In the past, ice fishing has been a common wintertime activity at the reservoir. Temporary ice fishing structures are placed on the reservoir and are visible from surrounding areas, including motorists on I-15. The structures provide contrast to the otherwise barren, ice-covered reservoir surface, and can be a common element of wintertime in the region.

Barretts Diversion Dam- Barretts Diversion Dam is located on the northern end of a relatively narrow canyon through which I-15, the Union Pacific Railroad, and the Beaverhead River pass. The park's dominant features include a gravel parking area, turf areas on the Beaverhead River which bisects the park, restroom facilities, signage, and a day-use group shelter on the east side of the river. Two small bridges are situated within the park, one for pedestrian access to the portion of the park on the east side of the river, and the other for vehicle access to the private residence on the east of the river.

Immediately east of the park and the Barretts Diversion Dam, steep canyon walls rise abruptly and provide a dominant, natural backdrop to the park's east and north facing viewers. With the exception of compacted earth parking areas, most of the park is covered by maintained grass, and numerous large deciduous trees provide canopy cover over much of the park area during the spring and summer months.

Recreational Facilities - Other than the dam, spillway, and outlet facilities, the developed recreation facilities surrounding Clark Canyon Reservoir are the most visible man-made structures other than access roads, the railroad, and highways. The most visually dominant recreation areas are Beaverhead Campground located east of the dam, the marina (which is currently unused, but contains structures and signage), and Camp Fortunate Overlook. These facilities contain access roads, delineated campsites and parking areas, restrooms, open-air shelters, and other facilities that are visually evident to users and travelers passing by.

Although some of the facilities are readily visible to most visitors and in mid-ground views of travelers on I-15 and SR 324, the facilities are not considered dominant in comparison to the scale of the overall surrounding view sheds. Other Clark Canyon Reservoir sites contain similar facilities, but generally have fewer structures and are situated in areas less visible from area visitors and residents.

Minimal night lighting is installed and operational at Barretts Diversion Dam, Beaverhead Campground and the marina. Night lighting is provided at these facilities for the purposes of safety, security, and user convenience. Lighting is limited to parking areas and buildings to provide some

visibility during nighttime. Although such lighting can be visible from surrounding areas, it does not contribute a significantly intrusive degree of light or glare to the project area. Other sources of light associated with the project area are from vehicles on area roadways and within campgrounds, lighting associated with the few private residences and businesses adjacent to Clark Canyon Reservoir and Barretts Diversion Dam, also campfires and individual camp lighting (e.g., lanterns, motor home lights, etc.).

Wildlife Viewing Areas - Wildlife Viewing Areas have been designated within the study area. Wildlife viewing areas include the developed bird watching trail below the dam. Other wildlife viewing areas include the low lands around the mouth of Horse Prairie Creek and Red Rock River. Antelope can frequently be seen on the southern hillsides above the reservoir. Moose have been seen in the Horse Prairie Creek and Red Rock River delta areas, while shorebirds and other waterfowl are abundant throughout the area.

Scenic Byways - Big Sheep Creek Back Country Scenic Byway is located south and west of Clark Canyon Reservoir. The roadway intersects with SR 324 west of Clark Canyon Reservoir, heads generally south then east, passing south of the Big Sheep Back Country, before turning northeast to I-15 near the town of Dell. The roadway is not considered to be within the study area; however, it is discussed briefly here due to its proximity. According to the Montana Department of Transportation (MDT):
"The road is mostly two-lane gravel with a few side roads that lead to the foot of the Rocky Mountains that provide many opportunities for solitude and exploration. Once past the canyons of the Tendoy Mountains, the traveler may pass only two or three cars along the entire route. Passing beneath the high rock cliffs of Big Sheep Canyon, one can look down into clear, deep pools of spring-fed Big Sheep Creek. Perhaps nowhere else in America can one see so many trout without leaving the car. Bighorn sheep and deer are a common sight in the evenings. The Byway provides one with the opportunity to see this country as it was experienced by prehistoric Indians and the first mountain men. The Rocky Mountains have hidden this southernmost point of Montana well, and it remains unchanged for those willing to explore the back country." (MDT, 2003)

Motorists accessing the Big Sheep Creek Back Country Byway via SR 324 from I-15 cross Clark Canyon Dam and traverse the northern portion of the study area. Because the scenic byway is west of the study area the reservoir lands, the facilities are out of the scenic road's view shed.

Wild and Scenic Rivers - A segment of the Beaverhead River between Clark Canyon Reservoir and Barretts Diversion Dam has been evaluated for potential eligibility and possible inclusion in the National Wild and Scenic River system. The evaluation concluded that this segment would be eligible with a classification of "Recreation", as presented in a recent report issued by the Montana BLM, Dillon Field Office entitled, "Final Report on Wild and Scenic River Eligibility Determinations" released in July 2002. The segment begins at the I-15 bridge at Pipe Organ Rock and ends where it leaves BLM land near the Dalys exit on I-15. This segment of the Beaverhead is considered "outstandingly remarkable" for recreation, fish, and historic values. This section of the

Beaverhead River is not within lands under Reclamation's jurisdiction and is located outside the project area.

2.4 Cultural Resources

2.4.1 Introduction

Since the early 1950's both intensive and nonintensive cultural resource surveys have been conducted at the Clark Canyon Reservoir (Deaver and Mortrer 1981) (Fenenga 1951). These studies have been carried out to comply with one or more Federal historic preservation laws and regulations. These laws and regulations direct Federal Agencies to manage cultural resources and set forth a policy to provide leadership in the preservation of the prehistoric and historic resources of the United States.

Federal historic preservation laws are designed to protect cultural resources for future generations and to promote scientific study of those resources. Studying the past provides insight into how humans utilized the environment in which they lived, and can provide keys to future changes.

In 1951 an Appraisal of the Archaeological and Paleontological Resources of the Jefferson River Basin, Montana was completed by the Missouri River Basin Survey of the Smithsonian Institution (Fenenga 1951). This survey included what is now the Clark Canyon Reservoir Area. The cultural resource survey, upon which this report was based, is very preliminary, and only a few late prehistoric sites were reported.

Following passage of the National Historic Preservation Act in 1966, cultural resource inventories in the Clark Canyon increased as Reclamation responded to the new mandates found in the legislation. In 1979, a cultural resource survey was conducted of the recreation area at Barretts, and at three recreation areas at Clark Canyon Reservoir. A cultural resource survey for the entire reservoir area above the water line was undertaken with the report completed in 1981. Both of these surveys have been useful for management of cultural resources although neither were performed to current standards making additional survey work necessary before specific projects are undertaken.

2.4.2 Prehistoric Period Resources

Research conducted in the area has revealed prehistoric sites and use areas that demonstrate extensive Native American utilization of the region. Artifact scatters and quarry sites show the area was used for stone tool production, bison kills and butchering sites demonstrate meat procurement, and camps with fire hearths and grinding stones demonstrate food preparation (Deaver 1981). Although none of the prehistoric sites at Clark Canyon Reservoir have been nominated to the National Register of Historic Places some may be eligible since they may be likely to yield information important in prehistory or history.

Beaver Slide

2.4.3 Historic Period Resources

The historic period at Clark Canyon Reservoir dawned in 1805 when the Lewis and Clark Expedition entered the area (Malone 1976). Their meeting with the Lemhi Shoshoni Indians at "Camp Fortunate" at a location now under the waters of Clark Canyon Reservoir was an important factor in the success of the expedition. The Lemhi Shoshoni Indians were not the only tribe known to have utilized the area; research has reported usage by the Bannock, Flathead, Pend Oreille, Nez Perce and Blackfeet. Even as the Lewis and Clark expedition returned to St. Louis, trapping beaver and fur trading was becoming key to the economy of the area. Although no major fur trading posts were developed in the Clark Canyon Area, camps of traders were often located in the broad valleys of southwest Montana. Members of the tribes found in the area trapped furs and traded as well as others from outside the region.

The broad valleys of the Beaverhead and Red Rock Rivers, along with Horse Prairie Creek have been used as travel routes for thousands of years. One likely prehistoric trail, marked by a cairn line bypasses a location that would be difficult to travel during many times of the year. Following the establishment of the Oregon Trail in Idaho, travel into the area was north over Monida Pass, and then down the Red Rock River through the study area. This route, followed portions of the prehistoric trail, was followed not only by early travelers but stage and freight lines, and then the railroad.

Discovery of gold by John White's party in 1862 started the gold rush to Montana. Bannack and Virginia City, located northwest and northeast of Clark Canyon became leading mining towns. Support systems including merchants, traders, stage transportation companies and saloons developed. By 1869, Corinne, Utah on the Union Pacific Transcontinental Railroad was the center for stage and freight traffic north to Montana. The trail was established from Corinne, Utah through Monida Pass, down the Red Rock River and on to Bannack, Virginia City, and other points north. Travel along this route brought many into the area. In the 1860's cattle and sheep were brought from California and Oregon into Montana utilizing these trails. The Utah and Northern Railroad built north across Monida Pass in March of 1880 and Dillon was founded as a terminus town (Malone 1976).

The Gilmore & Pittsburgh Railroad was constructed from the mainline of the Utah and Northern up Horse-Prairie Creek to the mines at Salmon and Gilmore, Idaho. A community named Armsted, Montana developed at the junction of the two railroads. Portions of the grade were so steep, that the Gilmore & Pittsburgh gained the nickname "Get Out and Push". The G, O & P was not profitable, and the tracks were removed in the early 1940's. The post office remained open at Armstead until 1962 (Anon 1990).

Construction of the Clark Canyon Dam was completed in 1964. With the filling of the Reservoir numerous changes occurred to the cultural landscape in the immediate area of the project. The railroad was relocated to higher ground, as were the highways. Farms and ranches that were located in the valley bottom and the town of Armstead were removed. Few historic remains are located on Reclamation land adjacent to the Reservoir, and none are on the register of historic places.

2.4.4 Future Heritage Resources Focus

The Federal Government is required by law and regulations to protect and preserve significant cultural resources. To this end, Reclamation's undertakings are subject to compliance required by the National Historic Preservation Act and its regulations found in 36 CFR Part 800. These mandate require that the Government consider the effects of its action or undertaking on prehistoric and historic resources before implementing those actions. Reclamation routinely consults with the Montana State Historic Preservation Officer (SHPO) and other interested parties before undertakings take place. The objective of the compliance process is to reduce or mitigate negative impacts to cultural resources.

2.4.5 Paleontological Resources

Like Cultural Resources, Paleontological Resources are fragile and nonrenewable. At Clark Canyon Reservoir, the geology is such that the presence of such resources is unlikely, and none have been reported.

2.4.6 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian Tribes or individuals. Examples of things that may be ITAs are lands, minerals, hunting and fishing rights, and water rights. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or Indian individuals by treaties, statutes, and Executive orders; these right are sometimes further interpreted through court decisions and regulations. The trust responsibility required that all Federal agencies, including Reclamation, take all actions reasonably necessary to protect trust assets.

2.4.7 Indian Sacred Sites

Executive Order # 13007 defines Indian sacred sites as "…any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian Tribe or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion: provided that the Tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." Federal agencies are required, to the extent practicable, to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites.

2.5 Land Use and Management

Approximately 70 percent of lands within Beaverhead County are under ownership or administration by public (federal and state) agencies. The largest portion (over 40 percent) is owned or managed by the U.S. Forest Service (Forest Service) and approximately 18 percent is owned/managed by the U.S. BLM. Lands under the jurisdiction of Reclamation comprise 4,747 acres, or approximately 0.1 percent of the total land area of Beaverhead County. A summary of land ownership within the county is provided in Table 2.5-1.

Table 2.5-1
Land Ownership/Administration in Beaverhead County

Ownership/Administration	Acres	Percent of County Total
Reclamation	4,747	0.1
BLM	662,940	18.7
U.S. Forest Service	1,442,682	40.7
U.S. Fish and Wildlife Service	39,229	1.1
U.S. National Park Service	675	< 0.1
U.S. Agricultural Research Service	15,508	0.4
Montana FWP	28,845	0.8
Montana DNRC	1,819	0.1
Montana State Lands	322,015	9.1
Private	1,007,200	28.4
Other	19,433	0.6
Total	**3,545,093**	**100**

2.5.1 Clark Canyon Reservoir and Adjacent Lands

Reclamation has management authority and jurisdiction over lands at Clark Canyon Reservoir and those that comprise Barretts Diversion Dam, see Land Ownership Map (Figure 2.5-1). A total of 800 acres of the Reclamation land surrounding Clark Canyon Reservoir is included within a land withdrawal granted by the BLM to Reclamation.[1] Lands surrounding those under Reclamation's jurisdiction include a combination of lands in private ownership and public ownership, including lands under the jurisdiction the BLM, U.S. Forest Service, and Montana Fish, Wildlife and Parks.

The lands and resources at Clark Canyon Reservoir are publicly owned and managed through a coordinated effort between several entities that have different management responsibilities. Reclamation maintains primary jurisdiction of the lands within the study area (Clark Canyon Reservoir and Barretts Diversion Dam) and is responsible for area resource management. Montana Fish, Wildlife and Parks is responsible for managing for fish and wildlife resources at Clark Canyon Reservoir and oversees the regulation of fisheries and performs fish stocking to enhance the reservoir fishery. Reclamation contracts with the Beaverhead County Weed District to treat noxious weeds at Clark Canyon Reservoir and Barretts Diversion Dam. The East Bench Irrigation District,

[1] A withdrawal is a formal action that sets aside, withholds, or reserves Federal lands by administrative order or statue for public purposes.

with over site from Reclamation, operates and manages the reservoir water operations and Clark Canyon Dam.

Reclamation's policies govern the use of lands within its jurisdiction and affect the way lands are managed in the future. Non-Reclamation land-use activities are authorized and managed under out-grants such as license agreements, lease agreements, right-of-way easements, special use permits, and other legal and binding contracts. There are numerous such agreements currently in place and include use permits for utility right-of-way, road maintenance, and fire suppression. In the past, Reclamation has entered into cooperative agreements for law enforcement.

Each land use for example authorization is subject to specific terms and conditions covering the use of the Federal estate. Lessees are restricted from conveying their permitted use to another party without the approval of Reclamation. Reclamation's Montana Area Office (MTAO) has copies of all authorized outgrant documents dealing with third-party use of Reclamation project purposes; they are to be, for the most part, temporary in nature and contain restrictive language that protects present and future Federal land interests.

A portion of the Land Use Authorization Directives and Standards states that Reclamation will prohibit any new exclusive/semiprivate use of Reclamation land unless directed otherwise in specific authorizing legislation and that existing private/semiprivate use will be eliminated when the use authorization expires unless a formal planning process determines that there is a significant public need and benefit for the exclusive private/semiprivate use and the land is not needed for other public or project purposes.

In addition, Reclamation issues permits for all improvements within easements, such as culverts and bridges, pipelines, and utilities. Special use permits are also considered for rock collecting, archeological investigation, airports, wells, mineral exploration and extraction (including sand and gravel), fire protection facilities, surface water use, and material storage. Pesticide application on Reclamation lands requires a plan and permit.

Periodically, Reclamation also evaluates its lands of possible future disposition. Pursuant to Section 204 of the Federal Land Policy and Management Act of October 21, 1976, Reclamation must review all its withdrawn lands to determine if they are needed for project purposes. Withdrawn lands not needed for project purposes should be returned to the public domain for administration by the Bureau of Land Management (BLM) or some other Federal agency that had original jurisdiction.

In the case of acquired lands, Reclamation must make a determination that the acquired lands are no longer needed for project purposes and are excess lands. These lands are reported as excess to the General Services Administration (GSA). GSA first offers the lands for sale to other Federal, State, or local public entities; if these entities do not want the lands, they are put up for sale through public bid at established fair market and competitive prices. Currently, all lands within Clark Canyon

Reservoir and Barretts Diversion Dam are needed for authorized project purposes and are not available for disposal.

2.5.2 Land Use Authorizations and Land Disposal

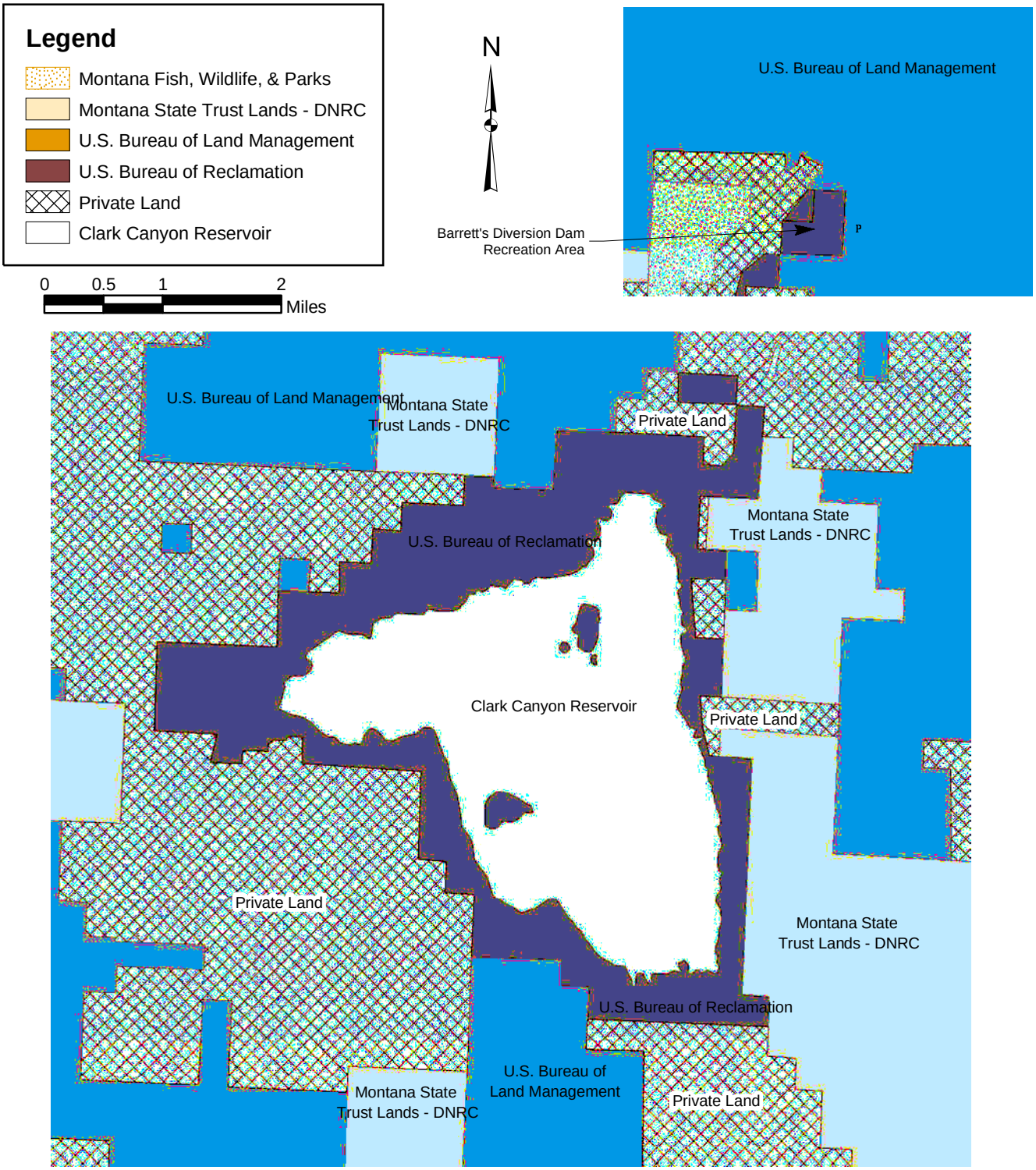
Land use authorizations include easements, leases, licenses, and permits which allow others to use Reclamation lands, facilities, and water surfaces. Land use authorizations are discretionary and must conform to the requirements contained in 43 CFR 429 and Reclamation Directives and standards for Land Use Authorizations (LND 08-01). Issuances of land use authorizations, require that Reclamation collect administrative fees and receive fair market value for the use of its lands.

Land use authorizations will not be issued when it is determined that the proposed use is incompatible with authorized project purposes, or where the proposed use poses health and safety concerns, results in unacceptable impacts to the environment, results in private exclusive uses, violates state, Federal, or local laws, regulations, ordinances, or zoning requirements, jeopardizes the interests of the United States, is an existing unauthorized use, the use will result in other adverse and unacceptable impacts, or where other alternatives are available. If a use authorization is granted, it is the policy of Reclamation to grant the least estate possible necessary to accommodate the intended use. Generally, this means that Reclamation will only issue a permit or a license, and will not issue leases or easements or other contractual documents that convey an interest in real property.

In regard to roads, telecommunication sites, microwave towers, transmission lines, and linear facilities, Reclamation will not issue any land use authorizations for these uses that does not clearly compliment the goals and recommendations contained in this plan. In the event electrical utilities are permitted they shall be buried, or if constructed above ground, they shall be constructed and only permitted if they do not interfere with the visual and aesthetic components of the landscape. All above ground utilities will provide measures of safety for the public and for wildlife species. All land use authorizations will be considered on a case-by-case basis, and issued at the sole discretion of Reclamation.

All reservoir lands are currently needed for project purposes and are not available for disposal thru sale, lease, or transfer to any other person, agency, or entity. In the event any of the lands within the reservoir are determined by Reclamation to be excess to project needs Reclamation will follow standard General Service Administration procedures to dispose of the lands. This process requires that any excess lands be first offered to other Federal or State agencies, then to local counties or municipalities, and lastly thru sale at public auction to the highest bidder.

Requests from outside parties, to use, project sand and gravel resources will not be allowed unless such use directly benefits Clark Canyon Reservoir or Barretts Diversion Dam and Park. Proposed oil and gas leasing/drilling may be permitted in accordance with BLM's mineral leasing program and subject to Reclamation's concurrence and subject to it's GP-135 special stipulations and form 3109-1 lease stipulations.



FRANSON NOBLE ENGINEERING

DATE: August 2004
SCALE: 1" = 5280'
Land Ownership
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Bureau of Reclamation

Clark Canyon Reservoir

Figure 2.5-1

Land Ownership

2.5.3 Barretts Diversion Dam and Adjacent Lands

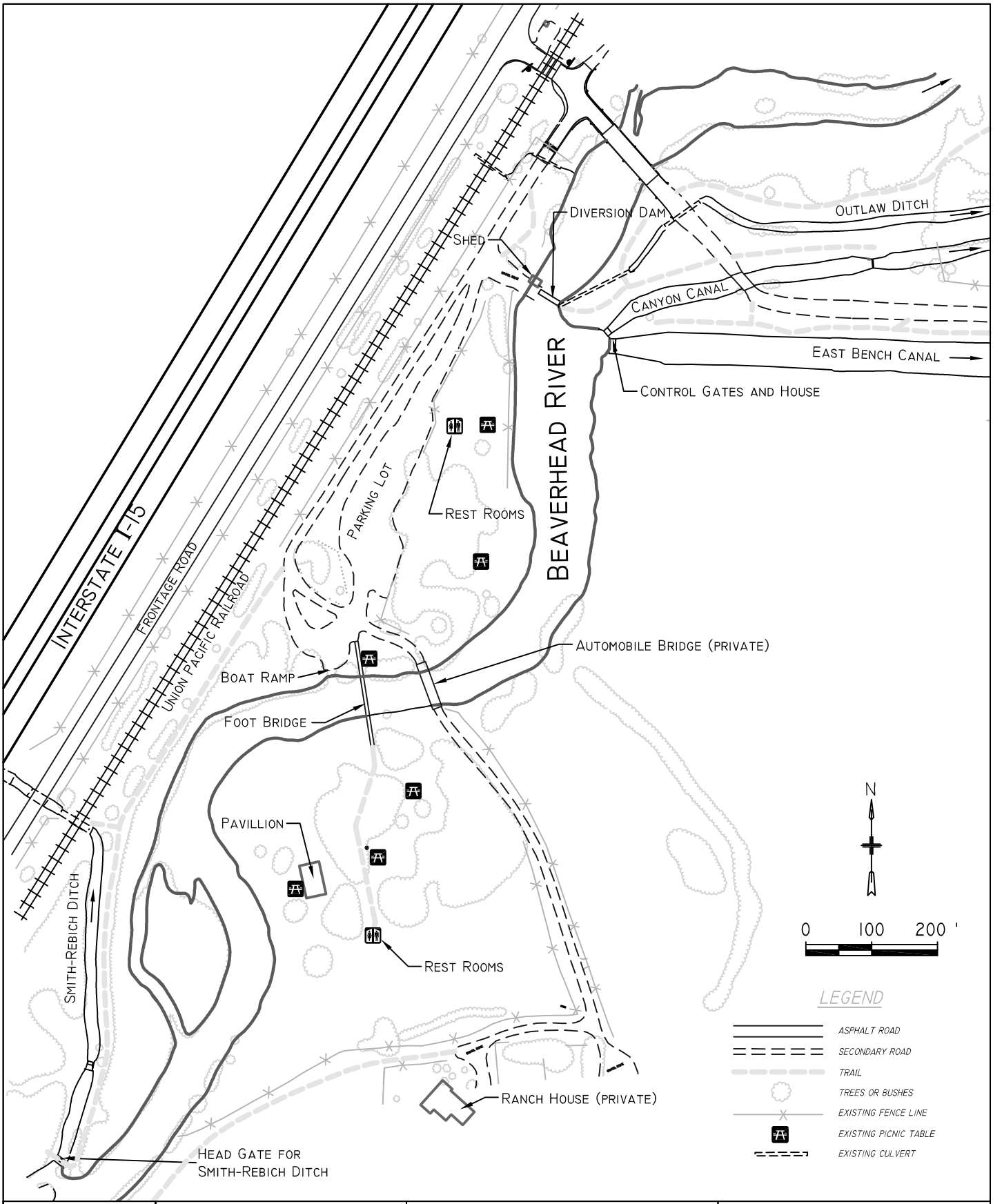
The area surrounding Barretts Diversion Dam is primarily in private ownership. There are also transportation rights-of-way and BLM lands to the west of the park. The U.S. Government, through the Bureau of Reclamation owns the Barrett Diversion Dam and surrounding lands that comprise Barretts Diversion Dam. The East Bench Irrigation District operates and maintains the East Bench Canal that delivers water to approximately 23,000 acres held in various private ownerships north of Barretts Diversion Dam (see Figure 2.5-2).

2.5.4 Land Management Planning

In addition to Reclamation's preparation and implementation of a Resource Management Plan for Clark Canyon Reservoir and Barretts Diversion Dam, other federal and state agencies maintain management plans, which guide their land, and resource management planning. Identifying the plans other area land management agencies provides important context for Reclamation's management activities. Coordinating land management activities with adjoining land management agencies help to reduce inconsistencies in uses and land management objectives and can help to reduce costs and minimize potential areas of conflict between uses.

2.5.5 Other Resource Management Planning

BLM is currently updating and preparing a Resource Management Plan for the management of lands and resources within the jurisdiction of the BLM's Dillon Field Office. These lands include those adjacent to Reclamation lands surrounding Clark Canyon Reservoir as well as lands located within the Clark Canyon Reservoir watershed, and therefore the decisions and direction taken by BLM in management of these public lands are an important consideration for Reclamation in its management decision. In January of 2003, BLM released baseline information collected as part of its RMP development and NEPA compliance effort. Since that time, BLM and cooperating agencies have hosted a series of public workshops to gather public input concerning the project. BLM released the Draft RMP and EIS for public comment in March 2004. BLM anticipates completion and release of an approved RMP by August of 2005.



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DATE:	AUGUST 2004
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BUREAU OF RECLAMATION

CLARK CANYON RESERVOIR

FIGURE 2.5-2

BARRETT'S DIVERSION DAM

2.5.6 Montana Statewide Comprehensive Outdoor Recreation Plan (SCORP)

The State of Montana's Statewide Comprehensive Outdoor Recreation Plan (SCORP) identified needs and opportunities for outdoor activities within the state during the 2003 through 2007 planning period. Although the SCORP does not contain provisions or requirements that are directly applicable to Reclamation's management of resources and recreation at Clark Canyon Reservoir and Barretts Diversion Dam. The findings and objectives identified in the SCORP are relevant to Reclamation's management planning efforts. In as much as efforts to contribute to statewide recreation objectives could influence Reclamation's management decisions. The two most relevant findings are the need to enhance access for water-based recreation activities and to improve access for wildlife-based recreation activities.

2.5.7 Montana Fish, Wildlife and Parks

The Montana Fish, Wildlife and Parks (MFWP) manages fish and wildlife activities within the state, including certain fishing and boating activities on the Beaverhead River below Clark Canyon Dam. MFWP is currently developing a river recreation management program, planned for completion in 2005. To develop the program, MFWP intends to work with the public on developing reasonable and equitable proposals for funding a river recreation management program to carry out the state's final river recreation management plan. The final river recreation management policy the MFWP Commission adopts will reflect comments from the public, the recommendations of the River Recreation Advisory Council (RRAC), and input from MFWP river managers and others. The river recreation management policy will guide decision-making and management actions for individual rivers around the state.

In order to learn more about the interests and values of the public, MFWP appointed the RRAC in August of 2002. The 22 council members represent anglers, boaters, outfitters, landowners, the Montana state legislature, the tourism industry, and the MFWP Commission. The RRAC developed recommendations for addressing the public's concerns about overcrowding and other social issues on rivers in Montana. The RRAC presented its recommendations to the MFWP Commission in July of 2003 and MFWP will use them to develop a river recreation management policy and program. For lands surrounding Clark Canyon Reservoir, MFWP is currently in the process of modifying its hunting regulations applicable to these lands. The new regulations will only allow the use of archery, shotgun, handgun, and black powder for hunting any game animal.

2.6 Recreation and Visitation

The primary land use in the Project area is for public recreation. The area is especially suited to the pursuit of unconfined and generally primitive recreation opportunities and activities.

Recreation activities in the Project area consist of land and water-based activities that take place primarily from May 1 through Labor Day weekend in early

September. In winter, there can also be local weekend use associated with ice fishing when conditions are appropriate. Most of the recreation users are from eastern Idaho and south central Montana. Residents of these areas are able to reach Clark Canyon Reservoir within 2.5 hours driving time (defined as the area of influence).

Clark Canyon Reservoir provides regional camping and water based recreation opportunities for the communities of Dillon, Anaconda, Butte and Idaho Falls as well as other Idaho and Montana residents. In addition, other out-of-state residents who are either passing through the area or are in the area to fish also patronize the facilities. It is estimated that approximately 59,000 people visit the area during the summer season.

The activities most visitors engage in include fishing, boating, camping, picnicking, swimming, and wildlife viewing.

2.6.1 Fishing

Clark Canyon Reservoir is the largest and most accessible reservoir in this part of south central Montana and provides a popular trout fishery. Anglers primarily catch burbot (ling), brown trout, and rainbow trout. Trout are the most important recreational and sustenance species. Until recently anglers were allowed 5 trout and 10 burbot (ling) per outing, but beginning in 2002 new rules by MFWP limited the catch to no more than 2 trout and 2 ling per angler day. The new regulations were put in place mostly in response to low reservoir conditions. The Beaverhead River directly below Clark Canyon Dam is a Blue Ribbon Trout fishery. Angler use is relatively constant from May through October with the peak use in June and July.

2.6.2 Boating

Motorized boats are the principle means to access and enjoy many opportunities available at Clark Canyon Reservoir. Motorboats support such popular activities as fishing, sightseeing, and boat-in camping. There are also some minor amounts of waterskiing, tubing, sailboarding, and personal watercraft uses (i.e. jet skiing). The reservoir is four miles in length and three miles in width and provides 17 miles of shoreline. The highest concentration of boating activities occurs between Armstead Island and the dam. The reservoir is situated in a high mountain valley that is often exposed to high winds, which often hamper boating activities. The few coves found on the reservoir margins become important shelters when water levels are high enough to cover and fill the cove bottoms.

Primary boat launch facilities at Clark Canyon Reservoir are located at the Beaverhead Campground and the marina. Unmaintained launch areas that can be used for smaller boats and PWC are available at certain other day-use and campground areas. The marina launch has not been used during the past two seasons, and the Beaverhead boat ramp has been the primary launch site. The reservoir can experience high winds during certain periods which can make boat launching difficult and limit boat-launching opportunities.

2.6.3 Off-Road Vehicle (ORV) Use

All Reclamation lands in the Project area are closed to motorized travel except designated roads. If ORV uses were to be accommodated, a plan would have to be developed and designated areas established as required by 43 CRF 420. However, the land areas are small, the low-lying vegetation is fragile, and most areas are used primarily for water based recreation uses. In spite of such closures, unauthorized ORV use occurs around several recreation sites. One of the areas in which ORV use has been extensive is along the shoreline between Lone Tree Campground and the old highway near the Red Rock River.

Reclamation has been erecting jackleg fencing (crossed wood pole fences) to contain ORV use and this has been effective where it has been employed. On adjacent lands administered by the BLM, management designations generally preclude ORV use, which is also limited to existing roads and trails only.

2.6.4 Hiking

Other than the Watchable Wildlife Trail below the dam, there are no other constructed trails in the vicinity of Clark Canyon Reservoir. However, boat-in and other overnight campers on Clark Canyon Reservoir often choose hiking as their primary day-use activity. Camping opportunities on Armstead Island, at Hap Hawkins, Lone Tree and West Cameahwait Campgrounds offer excellent hiking opportunities into highly scenic and diverse landscapes.

2.6.5 Recreation Sites and Facilities

Recreation sites and facilities within the Project area included developed and primitive day and overnight use areas, boat ramp, a marina, and popular fishing and group day use sites.

Following is an overview of the public recreation sites and facilities that are managed by Reclamation along the Beaverhead River and at Clark Canyon Reservoir. This includes developed, semi-developed, undeveloped, and random (dispersed) recreation sites.

2.6.6 Dispersed Sites

Dispersed sites are recreation areas defined as sites with no formal names and have an absence of facilities (or minimal facilities) around the reservoir. The dispersed recreation sites are an important complement to the developed sites. By using the many miles of undeveloped shoreline around the reservoir, visitors can gain a feeling of solitude just a short distance from developed sites. Due to the diversity of natural features, the dispersed recreation areas provide opportunities for wildlife observation, nature study, hiking, boating, and fishing. This helps to distribute use, reduce potential

user conflicts, and allow otherwise incompatible uses to take place at the same time. Dispersed area use tends to be less concentrated, less noisy, and less intense compared to use at the developed sites.

However, lack of sanitary facilities, trash receptacles, and designated parking areas in the dispersed areas has contributed to a decline in the quality of vegetative cover and natural soil conditions. Visitors sometimes leave trash, use the rock or bush as an open-air restroom, and drive and park wherever possible and convenient.

Nevertheless, the dispersed recreation areas around the reservoir are important components of the overall recreation spectrum. Water-based uses such as waterskiing, wind surfing, power boating, sailing, and boat fishing occur throughout the lake area, but are supported and enhanced by a number of dispersed and developed recreation sites along the shoreline. The quality of the recreation experience and natural resources of the area could be enhanced if minimum basic facilities are provided at dispersed recreation sites. Well-used dispersed sites include the Sacajawea Day Use. The Sacajawea Day Use area is a beachfront cove area with roads and has several road spurs that led to private cabins that stood in this area at one time. The site is situated off SR 324 between Camp Fortunate and HorsePrairie Campground. Dillon Beach is a popular beach area that is accessed through Cameahwait Campground and is a popular beach area with college students in Dillon; however, there are no facilities at the site.

2.6.7 Developed Sites

Recreation facilities currently provided at Clark Canyon Reservoir and Barretts Diversion Dam include 15 developed or formally recognized recreation facilities as summarized in Table 2.6-1.

Each of the developed sites at Clark Canyon Reservoir provides unique settings that offer visitors different options and features. The following description provides some background and characteristics of each site that are important considerations in the planning process. As part of the facility descriptions, the accessibility of the facility is described to provide a baseline for improvements that might be needed under the Americans with Disabilities Act of 1990 (Public Law 101-336). The ADA is a comprehensive civil rights law that prohibits discrimination on the basis of disability. It also requires that newly constructed and altered state and local government buildings and facilities, places of public accommodation, and commercial facilities be readily accessible to and usable by individuals with disabilities.

Table 2.6-1. Clark Canyon Reservoir Recreation Facilities

Name	# Picnic Sites	# Camp Sites	Group Shelters	Boat Ramp	Potable Water	# Toilets	Other
Barretts Diversion Dam	Shared	22	1	1	YES	4	Tent camping
Beaverhead River Fishing Access	Shared	5	-	1 (unimproved)	YES	2	Wildlife trail & interpretive signs
Buffalo Bridge Fishing Access	None	2	-	1 (unimproved)	NO	1	Remote parking
Beaverhead Marina	Shared	36	-	1	YES	3	RV hookup sites
Lewis & Clark Day Use Area	4	None	-	-	YES	1	Sites have wind shelters
Beaverhead Campground	Shared	22	-	2	YES	3	1 ramp is for low water. End of ramp elevation is 5512
Camp Fortunate Overlook	1	-	1	-	NO	1	Interpretive facilities
Horse Prairie Campground	Shared	17	-	1	YES	4	West & East units; most sites have shelters
Cameahwait Campground	Shared	11	-	-	YES	2	4 shelters
West Cameahwait Campground	Shared	2	2	-	YES	2	Primarily a group site
Hap Hawkins Campground	Shared	2	1	-	YES	1	Primarily a group site; has outdoor amphitheatre
Lone Tree Campground	Shared	20	-	1 (rough)	YES	4	Most sites have shelters
South Shore Fishing Access	None	-	-	-	NO	-	No formal parking
Red Rock Fishing Access	None	-	-	-	NO	-	Small gravel parking lot
Armstead Island Campground	Shared	2	-	-	NO	1	Boat-in only

Barretts Diversion Dam– Barretts Diversion Dam is a popular day use and overnight camping area situated on approximately 36 acres adjacent to the Barretts Diversion Dam. The site also has historic values since it is a camp location specifically noted in the journals of the Lewis and Clark Expedition of 1805-06. A large rock outcrop on the east bank, also noted in the Lewis and Clark journals, provides a dramatic drop back to the river and park site on the west bank. The park is set up to accommodate RV users and has a boat ramp that serves as a popular take out point for anglers using small drift boats. The park is used extensively by Dillon residents who often come in

organized groups. Demand is high for summer weekend use and sometimes groups end up competing for the single group shelter, or pavilion, on the same day. In recent years, the park has become more popular for outdoor weddings, business or civic organization picnics, and family reunions. The park entrance road and bridge are also used to provide access to a small ranch located directly adjacent to the park's southern boundary. Currently visitors using the group area must get special permission to drive vehicles across the bridge to access the pavilion. While many of the facilities are compliant with the Americans with Disabilities Act (ADA) standards, the pedestrian access to the facilities is not barrier free, and thus not fully ADA compliant.

Beaverhead River Fishing Access - This facility is situated directly below Clark Canyon Dam, and is often called the "campsite below the dam" or "below dam campsite". The gravel road leading down to the site is steep, somewhat narrow and has windy switchback turns. The facility is however well used by anglers and as a put in point for rafters. The site is used by both day users and campers, and the river setting is well vegetated and very appealing to campers and those who prefer a free-flowing river setting. A formal wildlife trail is part of the site's attraction and the trail is used by bird watchers and other wildlife enthusiasts as well as the campers and other day users. The wildlife trail has several interpretive signs and is listed in the Montana Fish, Wildlife and Park's "Watchable Wildlife Trails" program. The trail is managed by Reclamation.

Buffalo Bridge Fishing Access - The Buffalo Bridge Fishing Access site is not a formal designated or signed site but it is well known and used by anglers and commercial outfitters who launch their drift boats or other craft, serving as a "put-in" location. The site has a rough boat ramp and has limited space for boat trailer turn around and maneuvering. Additionally the parking spaces and launching lanes are not well delineated. Access and parking for the site is situated on the east side of I-15, adjacent to a private RV park. The access pathways to the toilet at the launch site are not currently accessible according to ADA standards.

Beaverhead Marina - The Beaverhead Marina facility has camping and boating facilities including campsites with full RV hookups along with a store and boat ramp. At this time only the campsites and boat ramp are open to the public as there is presently no concessionaire to run the marina facility. Reclamation would consider entering into an agreement with a concessionaire that would be able to provide gas, boating supplies, mooring slips, and some groceries as well as run the camping and day use facilities. However, because most operators in the past have had a difficult time making a profit, there has been little interest by new parties especially since upgrades are needed. At low lake levels the existing boat launch and dock area become too shallow for use by most watercraft.

Lewis & Clark Day Use Area - This site was recently converted day use only, as it was primarily a campground until the primary access road leading to Camp Fortunate Overlook was re-routed through the site. As a campground, the site was not well used due to lack of flat and level parking spots and lack of privacy and shelter, trees, grass or shrubs. Starting in 2003 the site was opened to

only day use and it is hoped the facilities will be better used for picnicking and other use by the visitors who are increasingly patronizing the Camp Fortunate Overlook facility.

Beaverhead Campground - This facility includes two boat ramps and a well-used campground. The facility is easily accessible off of I-15 and has the most trees and maintained (irrigated) lawn areas of any of the sites other than Barretts Diversion Dam. One boat ramp (adjacent to the dam) is especially suited for low water launching conditions, although it has a fairly steep launch lane. The other boat launch lane is more popular during periods of higher reservoir levels. The parking areas for each boat launch are not well defined and vehicle parking in vegetated areas has damage some of the ground cover and exposed native soils to erosion. The camping sites are in good condition but there are not very many level parking sites for large RV users.

Camp Fortunate Overlook - Camp Fortunate Overlook is situated on a high bluff providing dramatic views of Armstead Island and sweeping views of the west and north arms of the reservoir. The site has an aesthetically pleasing stone shelter and walkway and has several interpretive signs describing the Lewis and Clark Expedition and the significance of the events that took place leading to the success of the Corps of Discovery. Other than some additional maintenance items including replacement of the roof on the stone shelter, the site appears to need few improvements. The facility is experiencing steadily increasing visitor use due to the increased attention associated with the bicentennial celebration of the Lewis and Clark Expedition.

Horse Prairie Campground - The Horse Prairie Campground has a west and east camping loop divided by a small gully. The west unit has a boat ramp leading into a small cove that is usable during high reservoir levels. There are several impromptu roads leading off the main access roads that have been used increasing by ORV users. A jack leg fence has been erected along portions of the access road perimeter to help protect the surrounding area from loss vegetative cover due to random ORV use, however the fence has not fully blocked access to several areas that continue to be damaged by ORV users or other vehicles.

The restroom facilities are ADA accessible however the pathways leading to them and most campsites are not fully accessible.

Cameahwait Campground - Cameahwait Campground, sometimes called East Cameahwait to distinguish it from the West Cameahwait Campground, provides several camping sites with small wind shelters. The facilities show signs of age and deferred maintenance particularly the older wind shelters. Most of the facilities are not universally accessible and the site is one of the first to loose direct water front when reservoir levels recede in summer because it is located on the shallow upper end of the reservoir.

West Cameahwait Campground - The West Cameahwait Campground is a campground primarily oriented toward small groups because of its small size and because the site has an existing shelter. The site is adversely affected by lower lake levels since it is on the uppermost portion of the reservoir near the mouth Horse Prairie Creek. However the site is situated along a low-lying, somewhat protected, open field that stays fairly green late into summer. This location is used every August for a historic reenactment of the meeting of Lewis and Clark Expedition and the Lemhi Shoshone Indians which occurred at Camp Fortunate.

Hap Hawkins Campground - The Hap Hawkins facility is primarily a group camping facility that has a large community shelter for both cooking and eating. The facility is the most remote of all sites on the reservoir and offers a large degree of solitude. It also has a somewhat degraded outdoor amphitheater facility but otherwise most of the facilities are in good condition. The toilet facility is ADA compliant however the pathways to the toilets are not currently accessible.

Lone Tree Campground - This campground facility is a popular site used by a wide array of overnight users, many of who come in groups from Idaho. Thus the site is also commonly known as "Little Idaho". The facility is flat and grassy with wind shelters available at most sites. An informal boat launching area is available for car top boat launching or other small craft during higher reservoir levels.

South Shore Fishing Access - This site consists solely of a signed access road and large and flat shoreline area that provides access to anglers during higher water levels. Currently there is no formal parking area however the site is very lightly used.

Red Rock Fishing Access - This site consists of gravel parking area and several informal trails leading to the lower Red Rock River and upper reservoir shoreline, mostly accessible during periods of high reservoir levels. An old railroad and roadbed provide access to the reservoir shoreline. The site is also used by Montana Fish Wildlife and Parks to access their fish trapping facility on lower Red Rock River. The abundance of riparian and wetland vegetation provide good habitat for some wildlife species and the site is also used by wildlife enthusiast such as bird watchers.

Armstead Island Campground - This site is a boat-in only campground and day use area on the west side of Armstead Island. Boats must be able to anchor or pull up onto the beach since no mooring buoy is presently available. Most of the facility components are in disrepair due to age and a lack of maintenance. Because there is no potable water source and because the toilet facility is in bad shape, the site has somewhat limited appeal.

2.7 Transportation Resources

Access to Clark Canyon Reservoir and Barretts Diversion Dam is readily available to motorists from eastern Idaho and southwestern Montana via I-15. State Route 324 provides access from I-15 to the

north and western areas of the reservoir, from which unpaved roads provide access to individual day-use and campground areas.

2.7.1 Interstate 15 (I-15)

Interstate 15 is a four-lane, divided freeway that runs north/south through the project area and is the major north/south roadway in western Montana and eastern Idaho. I-15 provides for both through-traffic and local traffic movement within the region. The freeway is a limited-access roadway, with ingress and egress occurring only at controlled interchanges. Through travel is maintained year-round with snow clearing performed as necessary in the wintertime.

Exit 44 from the freeway is located immediately east of Clark Canyon Dam. This exit is the interchange with SR 324 which runs west from this location, crossing the dam, and continuing along the northern side of the reservoir, then continuing out of the study area to points west and south. This interchange also provides access to a private campground to the east of I-15. From this location, a gravel road proceeds north for a short distance, and then turns west, passing under the freeway, and providing access to Buffalo Bridge fishing access on the Beaverhead River.

Exit 37 from I-15 is located south of Clark Canyon Reservoir and provides access to County Road 188,"Horse Prairie Cut-across Road", (CR-188) which runs northwest from this location.

Exit 56, is located approximately one mile north of Barretts Diversion Dam, and provides access to a frontage road that crosses I-15 and the Union Pacific railroad tracks, to a gravel road that runs south to Barretts Diversion Dam.

2.7.2 State Route 324

State Route 324 is a two-lane, asphalt-surfaced roadway that interconnects with I-15 at Exit 44. From here, SR 324 crosses Clark Canyon Dam, and continues westward through the study area. This roadway provides the most direct route of travel from I-15 to recreation facilities along the northern side of Clark Canyon Reservoir, including: Beaverhead Campground, Beaverhead, Lewis and Clark Day Use, Camp Fortunate Overlook, Horse Prairie Campground, Cameahwait Campground, and West Cameahwait Campground. Access to each of these recreation facilities from SR 324 is via unpaved access roads that are generally in moderate condition and passable to most passenger vehicles.

2.7.3 County Road 188 – Horse Prairie Cut-across Road

County Road 188 (CR 188) is a gravel surface, maintained road that runs parallel to the southwest portion of Clark Canyon Reservoir. The road interconnects with SR 324 approximately three miles west of the reservoir and with I-15 near Red Rock, approximately four miles south of the reservoir.

The roadway provides access from I-15 or SR 324 to Hap Hawkins and Lone Tree Campgrounds, and South Shore and Red Rocks fishing access sites.

2.7.4 Recreation Facility Access Roads

As discussed above, access to individual recreation facilities at Clark Canyon Reservoir is generally via I-15 and either SR 324 and/or CR 188, from which individual access roads provide routes to each facility. Due to the reservoir shoreline contour, facilities along the northern shoreline of the reservoir (i.e., Beaverhead Campground, Beaverhead marina, Lewis and Clark Day Use, Camp Fortunate Overlook, Horse Prairie Campground, Cameahwait Campground, and West Cameahwait Campground) have generally shorter and steeper access roads, while facilities along the southwest shoreline (i.e., Hap Hawkins and Lone Tree Campgrounds, and South Shore and Red Rocks fishing access sites) have longer, but more gradually sloping access roads. All access roads are unpaved but are maintained in a passable condition for most types of passenger vehicles.

There is an access road to the fishing access location on the west side of Beaverhead River just below the dam. This access road begins at SR 324 west of the dam, and winds down a steep grade to the fishing access near the base of the dam. The road is in moderate condition; however, it is subject to storm water erosion. It contains sharp turns with steeply sloping sides and no guardrails or other safety improvements.

2.7.5 Planned Improvements

Construction of new and upgraded access roads is currently underway for the Camp Fortunate Overlook and west Cameahwait areas. The current Camp Fortunate Overlook access road intersects with SR 324 at a bend in the highway and has limited visibility, which creates safety concerns. The new access road will utilize the marina access road intersection with SR 324 and will run south to the overlook, parallel to and approximately 100 feet east of, SR 324. It is anticipated that Construction of these improvements will be completed in the summer of 2004.

2.7.6 Access to East Side Lands

There is a continuous public access from the Northern most portions of Reclamation's property (N ½ of Sec.5 T.9S. R.10W.), near the Buffalo Lodge to approximately 5 miles south to the Southern most boundary (center of Sec.28 T.9S. R10W.). Reclamation either holds a 60-foot public access right-of-way or owns the 60-foot strip of land where the road is located. There are portions of this area where the road is undeveloped or is a two-track road.

In 1985 and 1986, the General Services Administration sold parcels of Federal land near Clark Canyon Reservoir. These parcels were owned and administered by Reclamation and located east of

Interstate 15. On all parcels of land sold, a public access right-of-way was accepted and reserved unto the United States, its heirs and assigns. This public access right-of-way extends 60 feet Easterly from and paralleling the entire length of the West boundary of the sold parcels. This right-of–way was reserved to the United States, its heirs and assigns on the parcel of land located in the NE1/4SE1/4 Sec. 8 T.9S.R.10W. This public access right-of-way extends 60 feet easterly from and paralleling the entire length of the West boundary of the parcel and extending 60 feet Northerly from and paralleling the entire length of the South boundary of the parcel. This right-of-way was secured for public access and access to the radio repeaters.

2.7.7 Other Area Roads

In addition to recreation facility access roads, a small number of undesignated four-wheel-drive roads or trails are located within the Clark Canyon Reservoir area. Unauthorized travel on such roads is prohibited; however, illegal recreational use of these roads occurs on a limited basis and prohibited use is difficult to enforce. Limited signage and fencing has been installed in some areas to educate motorists and deter illegal use of these roads.

2.7.8 Airports

Four airfields located in Dillon, Dell, Wisdom, and Wise River serves Beaverhead County. The Dillon, Wisdom, and Wise River facilities are owned by Beaverhead County, while the Dell Airport is owned by the State of Montana. The largest airport serving the region is the Bert Mooney Airport, which is located in Butte, approximately 70 miles north of Clark Canyon Reservoir. The Bert Mooney Airport serves several incoming and outgoing flights each day, and is a hub for interconnecting flights between smaller local airports and larger regional airports. The major airport in the county is the Beaverhead County Airport located 3 miles north of Dillon. There are no airport facilities on Clark Canyon Reservoir lands.

2.7.9 Railroads

Union Pacific Railroad runs parallel to and east of I-15 through the project area. The railroad travels north from Idaho, and terminates near Butte at an interconnection with the Montana Western Railway. Passenger service has not been identified as available along this route.

2.8 Socioeconomic Conditions

This section discusses the existing economic and social setting of the region within which Clark Canyon Reservoir and Barretts Diversion Dam are located. Much of the information contained herein was compiled by Reclamation in a Recreation Management Conditions Assessment (Reclamation, 2002) completed in August of 2002.

2.8.1 Regional Setting

Clark Canyon Reservoir serves as a regional recreation resource for southwest Montana and northeast Idaho. Day-use visitors are most likely to come from locations within one to two hours drive time of the reservoir, whereas overnight visitors are likely to come from locations of up to 8 to 10 hours drive time away. Estimated driving distances and drive times for selected cities in the region are shown in Table 2.8-1.

Table 2.8-1
Estimated Driving Distances and Driving Time to Clark Canyon Reservoir from Selected Cities

City	Distance (miles)	Driving Time (hours: minutes)
Billings, MT	276	4:00
Bozeman, MT	168	2:33
Butte, MT	84	1:20
Dillon, MT	19	:20
Helena, MT	151	2:20
Missoula, MT	192	2:50
Idaho Falls, ID	128	2:00
Pocatello, ID	175	2:40
Source: Map Quest		

2.8.2 Population

Beaverhead County is located in southwest Montana, and shares its southern and western border with the state of Idaho. The county covers approximately 5,543 square miles. The county is sparsely populated, with an average population density of less than two people per square mile. In 1990 the population was 8,424 and by 2000 the population had grown to 9,202. In 2000, Beaverhead County contained about one percent of Montana's total population of 902,195.

The town of Dillon, located approximately 19 miles north of Clark Canyon Reservoir, is the county seat, and in 2000 had a population of 3,752. Dillon is the site of University of Montana Western, with a student population of approximately 1,100 during the school year.

Montana and Idaho are geographically large states with relatively low populations. The year 2000 populations of selected locations within or near Beaverhead County are provided in Table 2.8-2.

Table 2.8-2 Populations of Selected Counties and Cities	
County or City	**Population (year 2000)**
Montana Counties	
Beaverhead	9,202
Broadwater	4,385
Deer Lodge	9,417
Gallatin	67,831
Granite	2,830
Jefferson	10,049
Lewis and Clark	55,716
Madison	6,851
Missoula	95,802
Powell	7,180
Ravalli	36,070
Silver Bow	34,606
Montana Cities	
Billings	89,847
Bozeman	27,509
Butte	33,892
Helena	25,780
Missoula	57,053
Idaho Counties	
Bingham	41,735
Bonneville	82,522
Butte	2,899
Clark	1,022
Fremont	11,819
Jefferson	19,155
Lemhi	7,806
Madison	27,467
Teton	5,999
Idaho Cities	
Idaho Falls	50,730
Pocatello	51,466
Source: U.S. Census Bureau 2001a	

2.8.3 Income

In 1999, Beaverhead County had a per capita personal income (PCPI) of $20,493, and the county ranked 20th out of 56 counties in Montana. The PCPI was 95 percent of the Montana state average of $21,997, however, only 73 percent of the national average of $28,546. Montana's 1999 PCPI was ranked 48th in the United States (Bureau of Economic Analysis).

2.8.4 Major Industries by Earnings

In 1999, Beaverhead County residents earned a total of $112,609,000. This amount was 0.89 percent of the total for the entire state of Montana. The largest industrial sectors of Beaverhead County were government, services, farming, and retail trade. Services, government, and retail trade were the largest segments of the state's economy when measure by earnings. Table 2.8-3 lists earnings by industry for Beaverhead County and the state of Montana.

Table 2.8-3
Earnings by Industry for 1999

Sector	Beaverhead County		State of Montana	
	Amount of Earnings	Percent of Total	Amount of Earnings	Percent of Total
Farm	$12,205,000	10.8	$346,696,000	2.7
Agricultural, Forestry, and Fishing	$1,109,000	1.0	$104,800,000	0.8
Mining	[confidential]	[confidential]	$287,003,000	2.3
Construction	$7,122,000	6.3	$952,317,000	7.5
Manufacturing	$2,105,000	1.9	$920,290,000	7.3
Transportation and Public Utilities	[confidential]	[confidential]	$1,009,496,000	8.0
Wholesale Trade	$2,695,000	2.4	$633,187,000	5.0
Retail Trade	$11,978,000	10.6	$1,492,441,000	11.8
Finance, Insurance, and Real Estate	$9,712,000	8.6	$744,002,000	5.9
Services	$22,057,000	19.6	$3,413,936,000	27.0
Government	$29,740,000	26.4	$2,728,937,000	21.6
Total Earnings	**$112,609,000**	**100.0**	**$12,633,105,000**	**100.0**

Source: U.S. Census Bureau, 2001b

2.8.5 Major Industries by Employment

Total employment in Beaverhead County accounted for 0.95 percent of the total employment in the state of Montana in 1999. The largest sectors were services, government, retail trade, and farming. These industries accounted for almost 80 percent of all jobs in the county. Table 2.8-4 lists 1999 employment by sector for Beaverhead County and the state of Montana.

Table 2.8-4
Employment by Industry for 1999

Sector	Beaverhead County		State of Montana	
	Number Employed	Percent of Total	Number Employed	Percent of Total
Farm	731	14.0	32,122	5.8
Agricultural, Forestry, and Fishing	132	2.5	8,554	1.5
Mining	[confidential]	[confidential]	6,498	1.2
Construction	297	5.7	34,527	6.3
Manufacturing		2.3	29,287	5.3
Transportation and Public Utilities	[confidential]	[confidential]	27,327	4.9
Wholesale Trade	156	3.0	20,784	3.8
Retail Trade	1,003	19.2	104,951	19.0
Finance, Insurance, and Real Estate	372	7.1	36,927	6.7
Services	1,409	26.9	167,868	30.4
Government	1,011	19.3	83,431	15.1
Total Employment	**5,232**	**100.0**	**552,276**	**100.0**

Source: Bureau of Economic Analysis

2.8.6 Unemployment

The unemployment situation in Beaverhead County has been better than that of the state as a whole. Table 2.8-5 lists unemployment rates for Beaverhead County, the state of Montana, and the U.S.

Table 2.8-5
Unemployment Rates

Area	1990	1995	2000
Beaverhead County	4.8%	4.3%	4.0%
Montana	6.0%	5.9%	4.9%
United States	5.6%	5.6%	4.0%

Source: Bureau of Economic Analysis

2.8.7 Poverty

From 1989 through 1997 the poverty rate for Beaverhead County was consistently higher than the rates for Montana and the U.S. Table 2.8-6 lists poverty rates for Beaverhead County, Montana, and the U.S. The poverty rate for Beaverhead County declined by one percentage point in 1997. However, this rate remained more than one percentage point higher than Montana's rate and more than three points higher than the national average.

Table 2.8-6
Poverty Rates

Area	1989	1993	1995	1997	1999
Beaverhead County	18.6%	16.8%	17.7%	16.7%	[na]
Montana	16.1%	15.2%	15.8%	15.5%	15.6%
United States	12.8%	15.1%	13.8%	13.3%	11.8%

na = not available
Source: U.S. Census

Table 2.8-7
Poverty Levels
(household of 2 persons under the age of 65 with no children under 18)

Year	1989	1993	1995	1997	1999
Income	$8,343	$9,728	$10,259	$10,805	$11,214

Source: U.S. Census
*Household poverty levels are determined annually by the U.S. Department of Health and Human Services (HHS). Poverty rates in this table are those published by the U.S. Census based on HHS poverty levels and by consideration of household income, age , family unit size, and number of children under 18.

In association with the Recreation Management Conditions Assessment (Reclamation, 2002), a computer-based modeling software program was used to present baseline economic conditions and calculate estimated contributions of Clark Canyon Reservoir to the local and regional economy. The IMPLAN[2] input-output model, using 1996 data for Montana, identified the baseline economic conditions of total industrial output, employment, and labor income for Beaverhead County (see Table 2.8-8). The Beaverhead County output (in 1996 dollars) was $345,335,000, which amounted to approximately 1 percent of the total output for the state of Montana ($33,971,919,000). Only 5,218 of the state's 523,325 jobs were located in Beaverhead County in 1996. Employee income for the county was approximately $95,095,000; less than one percent of the state total of $9,953,882,000.

2.8.8 Contribution of Recreation at Clark Canyon Reservoir to the Local Economy

In order to estimate the contribution recreation at Clark Canyon Reservoir adds to the Beaverhead County economy, data on visitor use and recreation-related expenditures are necessary.

The five-year average for visitation approximates 59,000 recreation visits annually. However, only those visitors who live outside Beaverhead County and purchase goods and services in Beaverhead

[2] IMPLAN is the Impact Analysis for Planning model software originally developed for the U.S. Forest Service and maintained and updated by Minnesota Implan Group, Inc. (MIG).

County contribute additional dollars to the county's economy. This is based on the assumption that if recreation opportunities were not available at Clark Canyon Reservoir residents would spend the same amount of money on other recreational activities within (or possibly outside of) Beaverhead County. To account for the regional verses out-of-region visitor use, the annual visitor use figure is reduced to 50,000 recreation visits per year.[3]

Dillon Railroad Station

Specific data on expenditures by visitors to Clark Canyon Reservoir are not available. Therefore, a benefits transfer procedure provided expenditure data for this analysis. Such data was collected and developed for Canyon Ferry Reservoir, which is located in Broadwater and Lewis and Clark counties. Canyon Ferry is a larger reservoir, but offers similar opportunities for boating, camping and fishing. Both reservoirs are in Montana and share overlapping market areas (i.e., they both draw visitors from some of the same counties in Montana). For the purposes of this analysis, the Canyon Ferry expenditure patterns and data are assumed to be similar and representative of the out-of-region Clark Canyon visitor expenditures.

In addition, the Canyon Ferry expenditure data were collected and developed in such a manner that expenditures by economic sectors were identified. This fact allows the use of this data with IMPLAN to estimate the financial contribution that recreation at Clark Canyon Reservoir adds to the economy of Beaverhead County (i.e., approximately $252,500 in direct expenditures due to approximately 50,000 recreation visits originating from outside the region).

Total output related to recreation use at Clark Canyon Reservoir was approximately $335,000 in 1996 dollars. This figure includes direct impacts[4], indirect impacts[5], and induced impacts[6]. Recreation supports approximately nine jobs and provides $142,500 in labor income, as listed in Table 2.8-8. This contribution is less than one-fifth of one percent of the total in Beaverhead County.

[3] p. 71 of the Recreation Management Condition Assessment, Clark Canyon Reservoir and Barretts Diversion Dam. Bureau of Reclamation, Montana Area Office, August 2002.
[4] Direct impacts are the recreation-related out-of-pocket expenditures by visitors from outside the region that cause the change in output, employment, and income in the region.
[5] Indirect impacts are the changes in output, employment, and income caused by industries/firms purchasing goods and services from other industries within the region.
[6] Induced impacts are the changes in output, employment, and income caused by new household income generated by the direct and indirect expenditures in the region.

Table 2.8-8 Recreation Contribution to the Local Economy			
Economic Measure	**Clark Canyon Reservoir**	**Beaverhead County**	**Clark Canyon Reservoir Percent of County**
Industry Output	$335,456	$345,335,000	0.10%
Employment	9.3 jobs	5,218 jobs	0.18%
Labor	$142,569	$95,095,000	0.15%
Source: IMPLAN and Bureau of Reclamation			

2.8.9 Net Benefits of Recreation

Data limitations require certain generalizations and assumptions to estimate the net benefits of recreation[7] for Clark Canyon Reservoir. First, since fishing is the most popular activity of visitors, it is assumed that all visitors participate in this activity for at least some part of their visit to the reservoir and that the value for fishing will adequately represent the value for total recreation use by individuals at the reservoir. (A visitor to Clark Canyon Reservoir may participate in several different activities during the course of their visit, however, fishing has been selected as the proxy for all activities for the purposes of simplifying the analysis and assumptions.) The second assumption is that the most recent five-year average of visitation and use represents a reasonable expectation of future annual use (i.e., 59,000 recreational visits per year).

Benefit transfer research identified the average net benefits for fishing within the intermountain region, which includes Montana, as being $40.82 per person per day in 1996 dollars (Rosenberger and Loomis, 2000). Accounting for inflation (using the Consumer Price Index from the Bureau of Labor Statistics) brings this value up to approximately $46 in 2001 dollars. Therefore, the estimated annual value of fishing within intermountain region is approximately $2,714,000 in 2001 dollars.

2.9 Public Services and Utilities

Clark Canyon Reservoir and Barretts Diversion Dam are located in Beaverhead County, Montana. Public services within the area include those offered by public agencies as well as private companies. The following sections discuss a number of public services provided by or provided for areas within Beaverhead County.

2.9.1 Beaverhead County Police Protection

The Beaverhead County Sheriff's Office currently employs seven sworn officers, two reserve officers, four full-time 911 dispatchers, and other personnel that are funded through the general revenue fund for the County. The ratio of sworn officers to population is 1:1,286.

State and Federal Agencies - In addition to local enforcement agencies, there are a number of State and Federal agencies that provide services and coordinate with the Beaverhead County Sheriff's Office. The Montana Highway Patrol provides traffic enforcement for all state highways (primarily

[7] Net benefits or value of recreation equals the amount of money an individual would be willing to pay over and above the amount they actually do pay to participate in a recreational activity. Economists also refer to this amount as consumer surplus.

I-15 in Beaverhead County) and county roads MFWP, the United States Forest Service and the BLM provide wardens and law enforcement officers to enforce regulations on non Reclamation public land (Beaverhead County, 2003)

Beaverhead County Search and Rescue – The County Search and Rescue is a 60 member volunteer organization that operates under the direction of the Sheriff's office.

According to the County, as the needs for service in all areas of operation increase, so will the need for additional staffing. The facilities currently being utilized will need to be enhanced in the near future. Within the next 10 years, the need for larger administrative facilities will have to be addressed. As jail regulations become more stringent or mandatory, the present detention center will most likely be out of compliance. Other areas of concern will be additional jail staff and patrol staff to meet the needs of the public. (Beaverhead County, 2003)

2.9.2 Emergency Medical Services

Beaverhead Emergency Services, Inc. (Beaverhead EMS) provides emergency response to the City of Dillon and the surrounding area. Beaverhead EMS consists of 30 volunteers, which include 22 Emergency Medical Technicians (EMT's), five EMT Intermediates, one EMT Paramedic, and Registered Nurses. Beaverhead EMS has three advance life support level ambulances and one extrication truck, and average 300 to 400 runs per year, including transfers from Beaverhead County to hospitals in Missoula, Butte, and other regional medical facilities. (Beaverhead County, 2003)

Downtown Dillon

The Wisdom Volunteer Fire Department also operates an ambulance, averaging 11 to 12 runs per year over the past 5 years. The Wise River Volunteer Fire Company provides full ambulance services with five EMT's averaging 15 to 16 runs per year during the period between 1995 and 1999. The Grant Quick Response Unit provides emergency response and non-transport emergency medical services to the Grant/Horse Prairie area. The Lima Volunteer Fire Department provides ambulance service in the southern portion of Beaverhead County. Air ambulance and life flight services are available out of Idaho Falls and Missoula. (Beaverhead County, 2003)

2.9.3 Medical Facilities

The nearest medical facility to Clark Canyon Reservoir and Barretts Diversion Dam is Barrett Memorial Hospital, which is a 31-bed medical facility located in Dillon. Medical services available include intensive care, surgery, in-patient and out-patient care, physical therapy, laboratory services, x-ray/ultrasound/CT/MRI, emergency services, and other related services. (Beaverhead County, 2003)

2.9.4 Volunteer Fire Districts and Companies

Three organized fire districts and two fire companies provide fire protection throughout the County. Volunteers man all of these organizations. The districts are largely funded with property tax revenue, although all of the departments and fire companies rely heavily on donations, fund raisers, grants, and support from the Natural Resources and Conservation (NRCS) which, in most cases, is responsible for wild land fire protection. While rural fire districts or fire companies cover most of the county, there are portions of the county that do not have adequate protection for private property. In these areas, the County Fire Warden (Beaverhead County Sheriff) has jurisdiction and authority. (Beaverhead County, 2003) Reclamation is a participant in a multi-agency fire agreement with Federal, State, and County agencies that was established in 1982 and modified in 1994. The objectives of this agreement are coordination, prevention, detection, dispatch, and suppression of fire between the agencies.

The Beaverhead County Wild land Fire Management Plan, updated in 1999, provides for cooperative and mutual aid agreements between all of the volunteer departments and companies in the county and the DNRC and USFS. The Beaverhead County Disaster Plan allows for mutual aid between all of the fire departments and companies for non-wild land situations.

A number of challenges make residential fire fighting difficult for the VFD, particularly in the wild land residential interface. Lack of defensible space, limited water supplies and building materials that are not fire resistant make it difficult and dangerous for volunteers to adequately provide protection in these areas.

Fire District #1 - The Lima Volunteer Fire Department provides fire protection to the southern end of the county roughly from Clark Canyon Reservoir south to the Idaho border.

Fire District #2 - The Dillon Volunteer Fire Department provides fire protection to Dillon and the surrounding Beaverhead Valley. The Grant Volunteer Fire Department services the Horse Prairie area south and west of the portion of Clark Canyon Reservoir which is in District #2.

Fire District #3 - The Big Hole area and portions of the Grasshopper Valley are covered by this fire district. The Wisdom Volunteer Fire Department, Jackson Volunteer Fire Department, and Grasshopper Valley Volunteer Fire Company all serve portions of this district. The Grasshopper Valley Volunteer Fire Company was recently formed in 1999 and has constructed a fire hall, and also will service portions of the Grasshopper Valley that are currently not in any fire district.

Wise River Volunteer Fire Company - The Wise River Volunteer Fire Company provides fire protection to the northern part of the county along the Big Hole River and Highway 43 from Fish Trap to Divide.

All of the departments have relatively new buildings. Equipment upgrade and replacement is needed by all departments, but it is almost cost prohibitive for some of the smaller departments. (Beaverhead County, 2003)

2.9.5 Solid Waste

The Beaverhead County Solid Waste District operates the Beaverhead County Landfill located five miles west of Dillon. The landfill is licensed for municipal waste and provides service to Beaverhead and Madison Counties, and parts of Silver Bow and Deer Lodge Counties.

The existing landfill has capacity until the year 2063 based on current volumes of waste of approximately 11,000 tons per year, and the landfill has the capability for future expansion. (Beaverhead County, 2003)

2.9.6 Electric Utilities

Two electric utility companies serve Beaverhead County. The Montana Power Company serves an area of 97,540 square miles, including areas within Beaverhead County, with a total of over 280,000 customers. The Montana Power Company has a total capacity of approximately 100,000 kilowatts (kW) with a peak demand of approximately 15,000 kW. The second electric utility that serves portions of the county is the Vigilante Electric Co-op. Vigilante Electric has a system capacity of approximately 30,000 kW, and serves rural areas including Melrose, Glenn, Divide, Wise River and Wisdom. (Beaverhead County, 2003)